

TB CARE I ANNUAL REPORT YEAR 4

Ousmane Sembène

Black Docker

"I am ill already, I cough blood. What this you're telling me? Shouted Boubacar Can't you see her face? broke in his wife. I didn't notice it earlier. You'll come with me and see a doctor."

John Keats

Bright Star

"On the night I was taken ill –when so violent a rush of blood came to my Lungs that I felt nearly suffocated –I assure you I felt it possible I might not survive, and at that moment thought of nothing but you."

Fyodor Dostoyevsky

Crime and Punishment

"A rather tall, slim and graceful woman, terribly emaciated, with magnificent dark brown hair and with a hectic flush in her cheeks. ...her lips were parched and her breathing came in nervous broken gasps. Her eyes glittered as in fever and looked about with a harsh, immovable stare. And that consumptive and excited face with the last flickering light of the candle-end playing upon it made a sickening impression".

Charles Dickens

Nicholas Nickleby

"There is a dread disease which so prepares its victim, as it were, for death; which so refines it of its grosser aspect, and throws around familiar looks unearthly indications of the coming change; a dread disease, in which the struggle between soul and body is so gradual, quiet, and solemn, and the result so sure, that day by day, and grain by grain, the mortal part wastes and withers away"

John Bunyan

The Life and Death of Mr. Badman

"Yet the captain of all these men of death that came against him to take him away was the consumption, for it was that that brought him down to the grave"

Sylvia Plath

The Bell Jar

"TB is like living with a bomb in your lungs. You just lie around very quietly hoping it won't go off"



Year 4 Annual Report

1st October 2013 – 30th September 2014

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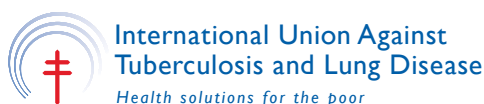
The cover of this report shows quotes about TB from famous authors whose lives have been touched by the disease.



TB CARE I PARTNERS

American Thoracic Society (ATS)
FHI 360

Japan Anti-Tuberculosis Association (JATA)
KNCV Tuberculosis Foundation (KNCV)
Management Sciences for Health (MSH)
International Union Against Tuberculosis and Lung Disease (The Union)
The World Health Organization (WHO)



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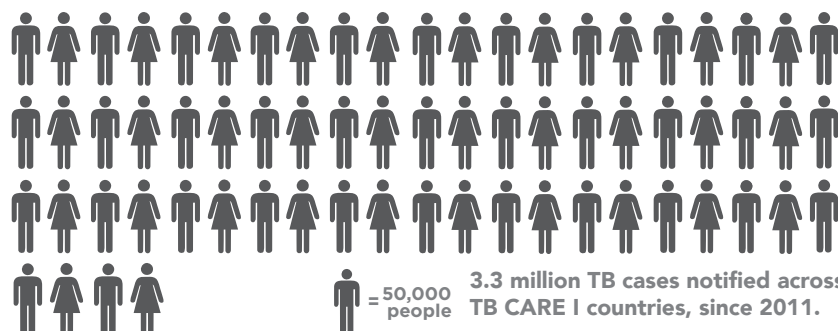


ABBREVIATIONS

ADR	Adverse drug reaction	LTFU	Lost to follow-up
ART	Antiretroviral therapy	MDR	Multi drug resistance
ATS	American Thoracic Society	MDR-TB	Multidrug-resistant tuberculosis
CAR	Central Asian Republics	M&E	Monitoring and evaluation
CB-DOTS	Community-based directly observed treatment short course	MOH	Ministry of Health
CDC	Centers for Disease Control and Prevention	MSH	Management Sciences for Health
CDR	Case detection rate	NAP	National AIDS Program
C/DST	Culture/drug susceptibility testing	NRL	National reference laboratory
CoE	Center of Excellence	NSP	National strategic Plan
CN	Concept note	NTP	National TB Program
CPT	Cotrimoxazole preventive therapy	OD	Operational district
CSO	Civil society organization	OGAC	US Office of the Global AIDS Coordinator
CTBC	Community tuberculosis care	OR	Operations research
CV	Community volunteers	PCA	Patient-centered approach
DC	Detention center	PDA	Personal digital assistance
DOT	Directly observed treatment	PEPFAR	President's Emergency Plan for AIDS Relief
DOTS	Directly observed treatment short course	PLHIV	People living with HIV/AIDS
DR	Drug resistance	PMDT	Programmatic management of drug-resistant Tuberculosis
DRS	Drug resistance survey	PPM	Public private Mix
DST	Drug susceptibility testing	QMR	Quarterly monitoring report
ECSA	East, Central and Southern Africa	QMS	Quality management system
EP	Extrapulmonary	QPI	Quality performance laboratory indicators
EQA	External quality assurance	REC	Regional ethical review committee
ERR	Electronic recording & reporting	RIF	Rifampicin
FAST	Finding cases Actively, Separating them safely and Treating them effectively	RR-TB	Rifampicin-resistant TB
FMoH	Federal Ministry of Health	SRL	Supra-national reference laboratory
GF	Global Fund	SRLN	Supra-national reference laboratory network
GFATM	Global Fund to Fight Aids, Tuberculosis and Malaria	SOP	Standard operating procedures
GLI	Global Laboratory Initiative	SS+	Sputum smear positive
GPS	Global positioning system	ST	Specimen transportation
HCW	Health care worker	TA	Technical assistance
HF	Health facility	TATs	Turnaround times
HIV	Human immunodeficiency virus	TB	Tuberculosis
HSS	Health system strengthening	TB CAP	Tuberculosis Control Assistance Program
IC	Infection control	TB-IC	Tuberculosis infection control
ICF	Intensified case finding	The Union	International Union Against Tuberculosis and Lung Disease
IPC	Infection prevention and control	TORG	Tuberculosis Operational Research Group
IPT	Isoniazid preventative therapy	TRAC	TB Research Advisory Committee
ITM	Institute for Tropical Medicine	TSR	Treatment success rate
ISTC	The International Standards for Tuberculosis Care	USAID	United States Agency for International Development
JATA	Japan Anti Tuberculosis Association	VITIMES	Viet Nam TB Information Management Electronic System for Drug-sensitive TB
KIT	Royal Tropical Institute	WHO	World Health Organization
KNCV	KNCV Tuberculosis Foundation	Xpert	GeneXpert MTB/RIF
LPA	Line Probe Assays		
LSP	Laboratory strategic plan		
LTBI	Latent tuberculosis infection		

EXECUTIVE SUMMARY

As one of the main mechanisms for implementing the United States Agency for International Development's (USAID) TB strategy, TB CARE I has made notable contributions to USAID's targets and TB control efforts globally. In this fourth and final year (October 2013-September 2014), TB CARE I has implemented 34 new core/global projects, four regional projects and 17 country projects. Below are some of the Year 4 program highlights as well as TB CARE I contributions towards USAID targets:



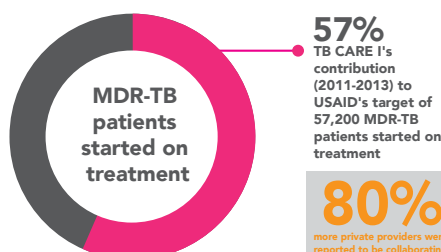
3.3 million TB cases notified across TB CARE I countries, since 2011.

15,772 people
were trained

(44% female)

13,830 documents
were downloaded
from the TB CARE I
website.

1 book icon = 300 publications



57%
TB CARE I's contribution (2011-2013) to USAID's target of 57,200 MDR-TB patients started on treatment

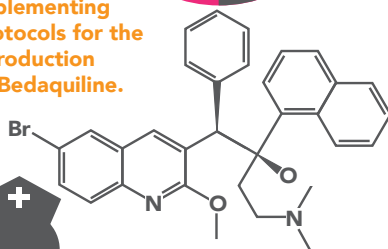
5 TB CARE I countries surpassed the 84% USAID target for case detection rate

80%
more private providers were reported to be collaborating with the NTP in 2013 across just five countries

71%
of TB/HIV patients are on ART (2013) compared to only 39% in 2010

TB/HIV Patients on ART

3 countries are implementing protocols for the introduction of Bedaquiline.



After implementation of the Ndola District TB-IC project in Zambia, TB incidence among healthcare workers was no higher than the general population suggesting good implementation of TB-IC.

33,666

6,415

In TB CARE I-supported areas of five countries five times more TB cases were notified in Year 4 than in Year 2.

The International Standards of Tuberculosis Care (ISTC) 3rd Edition were released with TB CARE I support.

16
Operations Research Study Results Disseminated



65% - TB CARE I's contribution (2011-2014) to USAID's target of 2.55M cases successfully treated by 2014



39,398 TB cases (including 10,060 RR-TB cases) detected by Xpert since the start of TB CARE I

1 book icon = 1000 cases

3 National TB Prevalence Surveys Completed

50%

of TB grants in TB CARE I countries are rated A1 or A2 compared to only 39% of all other TB grants.

20,508
RR-TB or MDR-TB cases diagnosed in 2013

TB CARE I supported Global Fund concept note development in 14 countries (82%).

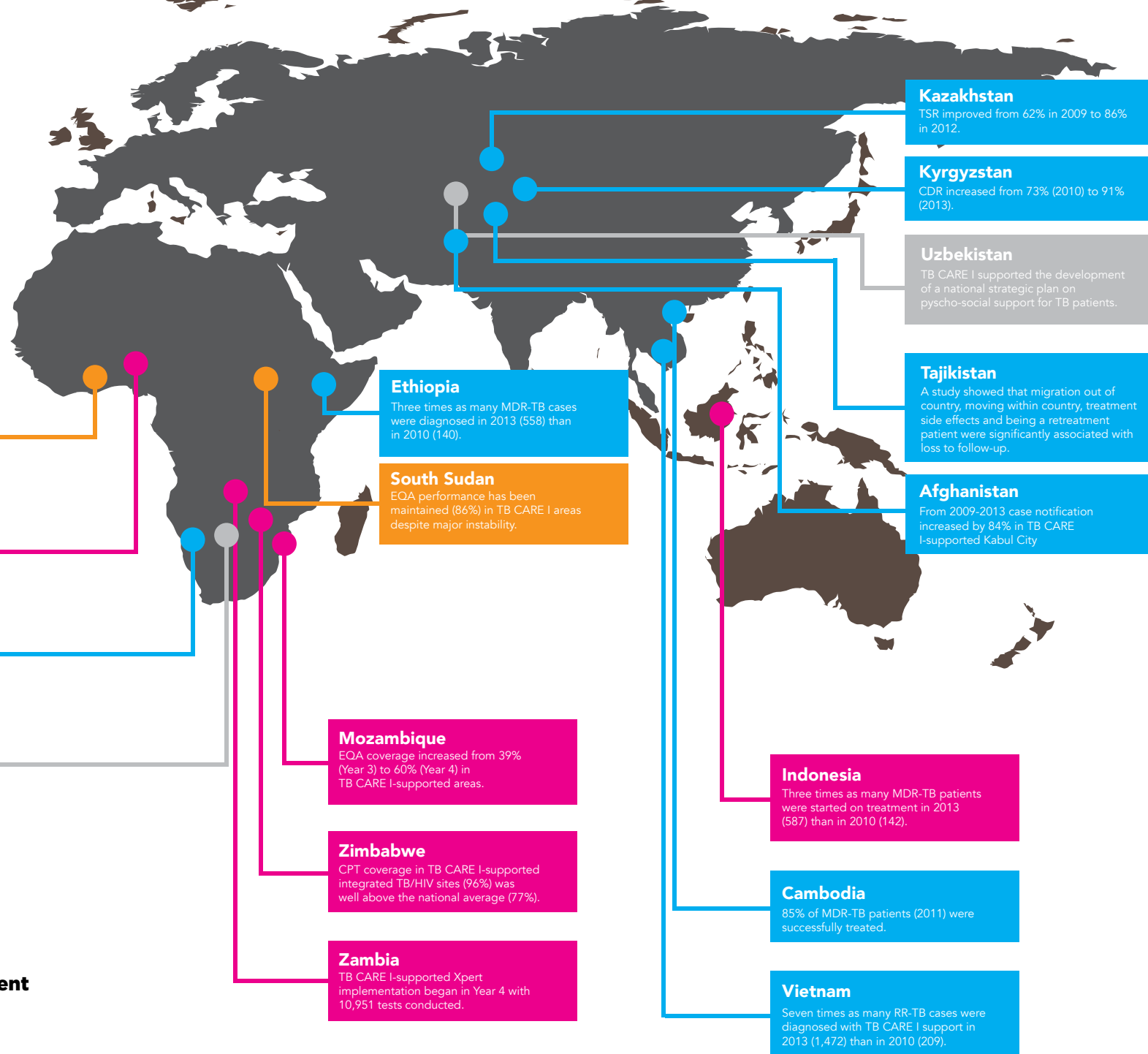
TB CARE I COUNTRY HIGHLIGHTS YEAR 4

Ghana
The proven TB CARE I intensified hospital-based TB case detection approach has been included in both the new national strategic plan and the Global Fund concept note.

Nigeria
60% more TB patients were diagnosed by private providers in TB CARE I areas in 2013 compared to 2012.

Namibia
92% of TB patients in 2013 had an HIV test results recorded in the TB register (76% in 2010).

Botswana
TB CARE I supported the development of an epi analysis, the national strategic plan and the single TB/HIV concept note.



Large Investment

Medium/Large Investment

Medium Investment

Small Investment

INTRODUCTION





TB CARE I is a USAID five-year cooperative agreement (2010-2015) that builds and expands upon previous USAID TB prevention and treatment efforts over the last twelve years. TB CARE I is one of the main global mechanisms for implementing USAID's TB strategy as well as contributing to TB/HIV activities under the U.S. President's Emergency Plan for AIDS Relief (PEPFAR). KNCV Tuberculosis Foundation (KNCV) is the prime partner and leads a coalition of internationally-recognized organizations that work in TB control.

The Coalition members are American Thoracic Society (ATS), FHI 360, International Union Against Tuberculosis and Lung Disease (The Union), Japan Anti- Tuberculosis Association (JATA), Management Sciences for Health (MSH) and the World Health Organization (WHO).

There is a second program, TB CARE II, which shares the same objectives, technical strategies and indicators as TB CARE I.

The TB CARE programs focus on eight priority Technical Areas:

1. Universal and Early Access
2. Laboratories
3. Infection Control
4. Programmatic Management of Drug Resistant TB
5. TB/HIV
6. Health Systems Strengthening
7. Monitoring & Evaluation, Operations Research and Surveillance
8. Drug Supply and Management

More information can be found on our website:

www.tbcare1.org

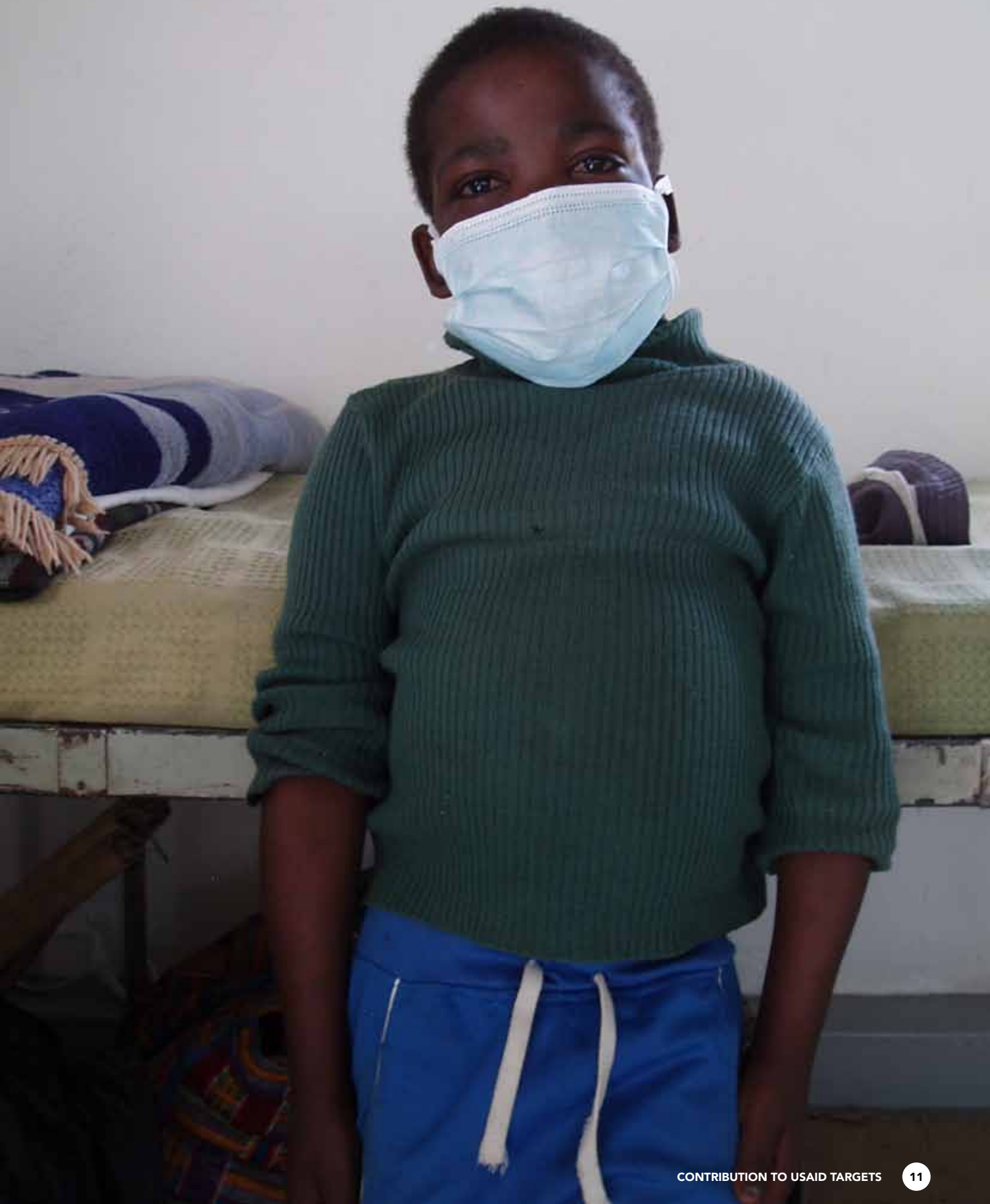
Although technically a five-year program ending in September 2015, TB CARE I's successful ability to meet strong USAID demand and investment across 21+ countries, means the program is ending after only four years of implementation. In this fourth and final year (October 2013 - September 2014), 34 new core/global projects, four regional projects and 17 country projects were implemented¹.

This annual report demonstrates the program's contribution to USAID's global targets and highlights key results across all technical areas in this fourth year of implementation. Whenever possible, country-level data were extracted from the WHO Global TB Report 2014; otherwise national data were collected by TB CARE I from National Tuberculosis Programs (NTPs) or other appropriate data sources (i.e. National AIDS Program (NAP), prison system). Additional details on country achievements and country-specific indicators can be found in the forthcoming country-specific end-of-project reports, which will be available in December 2014.



¹ Projects in Kenya and Uganda were closed out at the end of Year 3. Therefore, programmatic Year 4 data were not collected for these countries, but 2013 population/patient-based data (from the WHO) are shown as these projects were operational during this time period. A small project is also being implemented in Senegal, but does not have full-time staff or activities on the ground so is not included in the annual data analyses.

CONTRIBUTION TO USAID TARGETS



USAID GOALS

USAID's goal is to halve TB prevalence and death rates in USAID assisted countries by 2015 (relative to the 1990 baseline) and is consistent with the Global Plan to STOP TB. Three key targets have been identified for achieving this goal:

- Sustain or exceed 84% case detection rate and 87% treatment success rate of those cases in countries with established USAID TB programs;
- Treat successfully 2,550,000 new smear-positive TB cases;
- Diagnose and initiate treatment for 57,200 new cases of MDR-TB.

TB CARE I's contribution to USAID targets is measured through the following core indicators at the national level as reported in the annual WHO Global TB Report:

1. Number of cases notified (all forms and new confirmed)
2. Case detection rate
3. Treatment success rate
4. Number (and percent) of confirmed TB cases among healthcare workers (HCWs)
5. Number of MDR cases diagnosed and put on treatment.



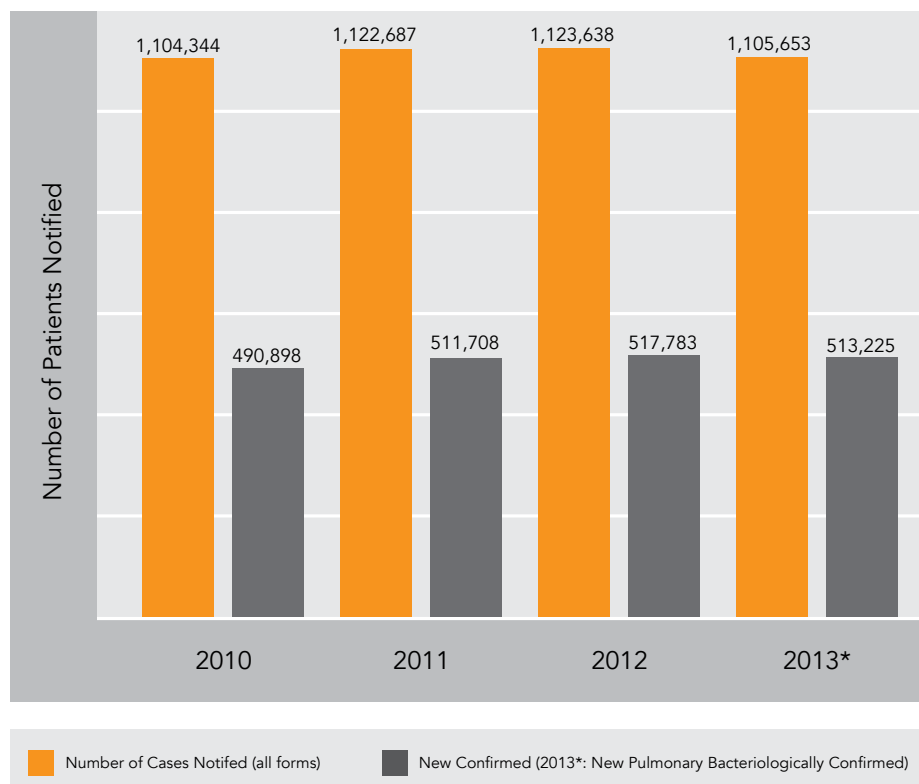
Note:
TB CARE I is assisting NTPs to improve the prevention and control of TB from a country perspective; in addition to in-country resources (government funding, etc.), countries are often also assisted through other means such as the Global Fund. Therefore it is difficult to measure to what extent changes in these indicators are attributable only to TB CARE I interventions. In some countries TB CARE I operates on a selected range of technical areas and the geographic area is not always country-wide. The technical area indicators can help to illuminate TB CARE I's impact in specific areas.

CASE NOTIFICATION

Since the start of the program (2011-2013), nearly 3.3 million TB cases (all forms) have been notified across TB CARE I countries¹. In 2013², across all 19 TB CARE I countries that had active projects that year, 1,105,653 TB cases (new and relapse) were notified of which 513,225 were new bacteriologically confirmed pulmonary TB cases. In comparison to baseline levels (2010), the number of TB cases notified (all forms) has remained constant, while relative increase of 5% among new bacteriologically confirmed cases was seen. Although this leveling off in the number of notified TB cases is consistent with the slow global decline in TB incidence, seeking out and treating all TB cases is still mission critical to TB CARE I. In 2013, 59% of all new and relapse TB cases were male with variation by country ranging from 40% in Afghanistan to 74% in Viet Nam. Countries that continue to show a notable increase in the number of new bacteriologically confirmed cases include Afghanistan (10%), Mozambique (15%), Nigeria (16%) and Uzbekistan (17%). Interestingly, the overall number of cases (all forms) in Kazakhstan has declined by 20% since 2010, however the number of new bacteriologically confirmed cases has increased by 66% over the same time (7,942 in 2013); this may be a sign of improved quality diagnosis (more bacteriologically confirmed cases) and TB treatment (less relapse), improved impact of TB control activities, and/or lower case detection and notifications.

In 2013, 1,105,653 TB cases were notified across 19 TB CARE I countries

Number of cases notified (all forms and new bacteriologically confirmed), 2010-2013*, in 19 TB CARE I countries that had active projects in 2013 (WHO 2014)



¹ Total number of TB CARE I countries each year: Year 1 (18), Year 2 (21), Year 3 (19), Year 4 (17). For 2013 data (i.e. patient-based data coming from the WHO) a denominator of 19 countries was used (i.e. Afghanistan, Botswana, Cambodia, Ethiopia, Ghana, Indonesia, Kazakhstan, Kenya, Kyrgyzstan, Mozambique, Namibia, Nigeria, South Sudan, Tajikistan, Uganda, Uzbekistan, Viet Nam, Zambia and Zimbabwe). For programmatic data (i.e. TB CARE I- collected for the October 2013-September 2014 period) a denominator of 17 countries was used (i.e. Uganda and Kenya excluded).

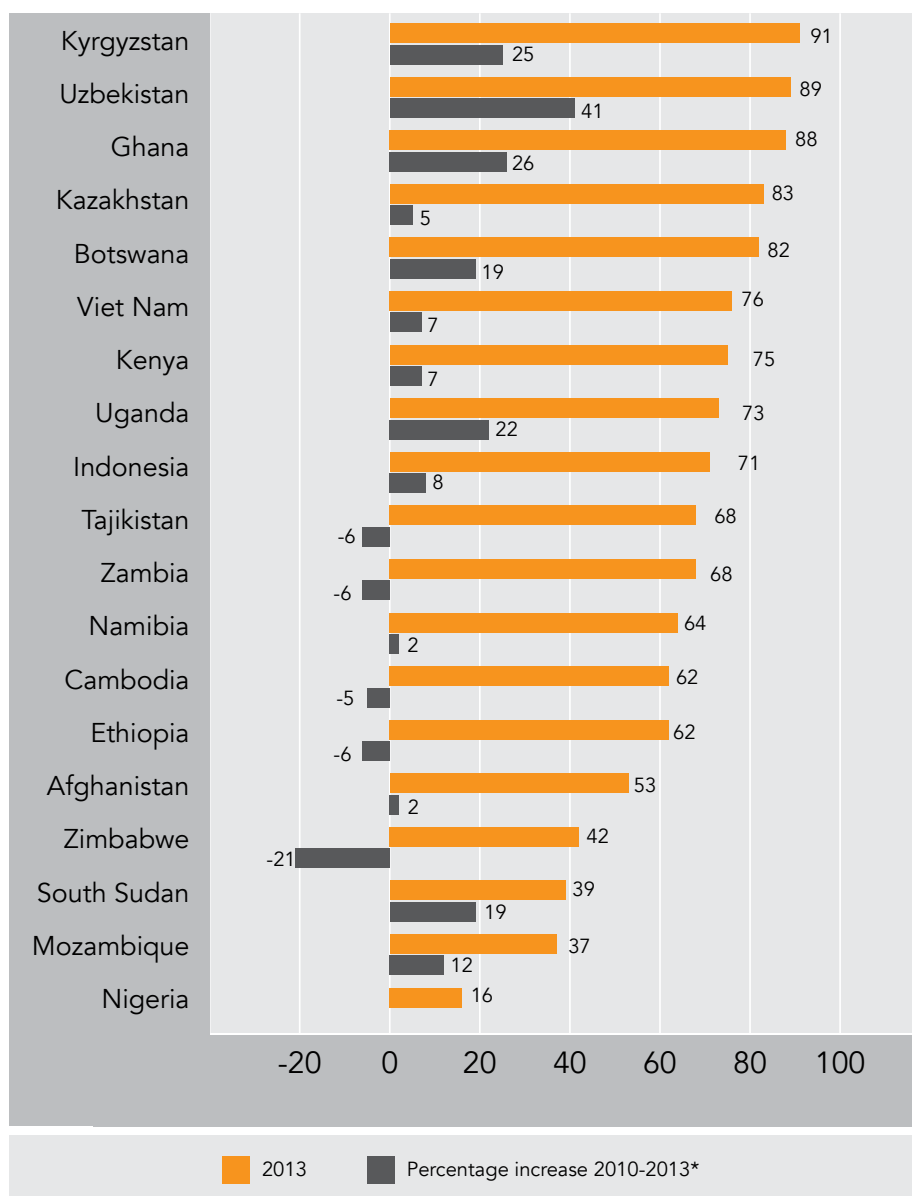
² New WHO case definitions and reporting forms went into effect in 2013. This report uses the new terms and indicator definitions. Some changes make it difficult to compare 2013 data to previous years. We will do our best to highlight throughout the report where changes in definition may affect the comparability of the data across years.

CASE DETECTION RATE

Case detection rates (CDRs) have improved in 13 TB CARE I countries since the start of the program, eight of which showed improvement in the last year alone. Compared to seven countries last year that surpassed the Stop TB target of 70% CDR, there are now nine countries that surpass this target (Botswana, Uganda and Uzbekistan reached the target in 2013). Most importantly, three countries have surpassed the USAID target of 84% CDR this year: Ghana³ (88%), Kyrgyzstan (91%) and Uzbekistan (89%). Notable increases in case detection rates from project start (2010) to 2013 include Uzbekistan (41% increase), Ghana (26% increase), Kyrgyzstan (25% increase) and Uganda (22% increase). A new prevalence survey in Nigeria has revealed major gaps in case detection with a CDR that has dropped to 16% from a previously reported rate of 51% for 2012. This underscores the importance and need for periodic prevalence surveys to understand the true burden of disease.

Three countries have surpassed the USAID case detection rate target of 84%

2013 case detection rates (percent), all forms, among 19 TB CARE I countries and percentage change from 2010 rates (WHO 2014)



*Percent change measured between 2011 and 2013 for South Sudan

³ Results from a new prevalence survey will be available at the end of 2014, which likely will affect the CDR.

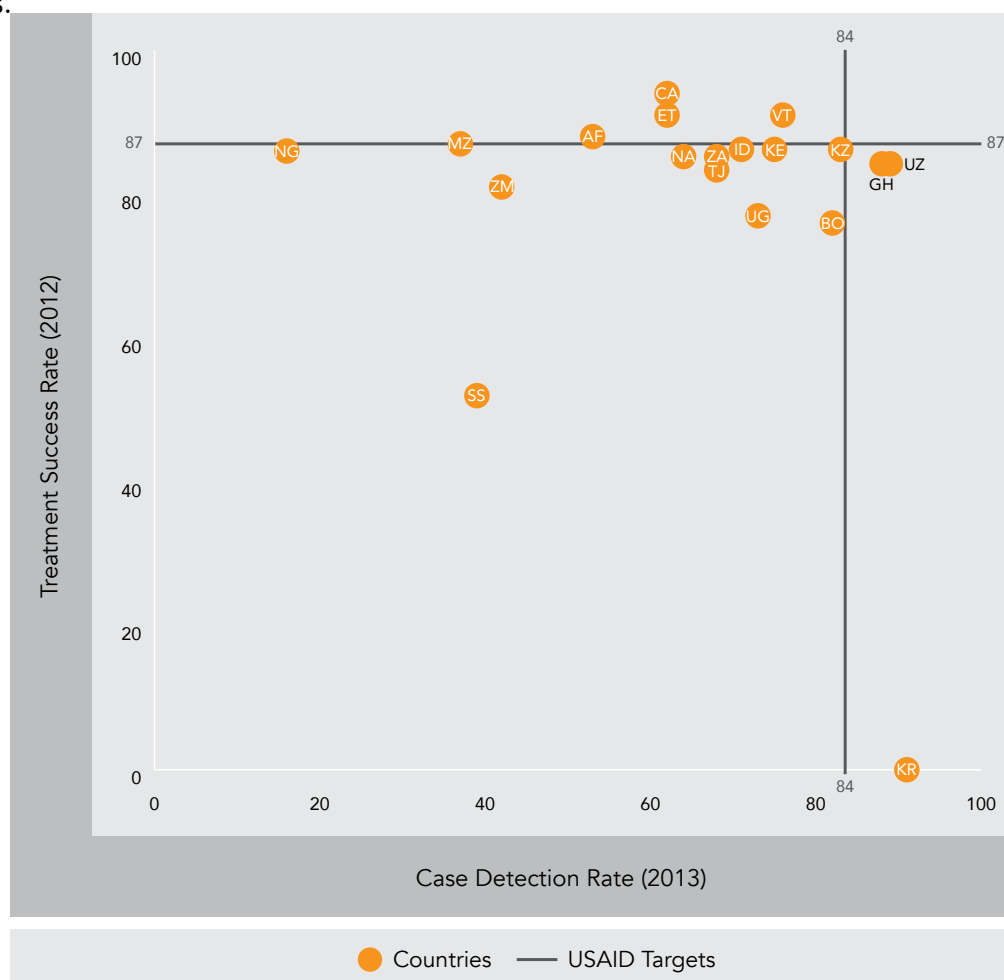
TREATMENT SUCCESS RATE

In 2013, the WHO began calculating treatment success rates on all new and relapse patients (as opposed to previously only reporting treatment success for new sputum smear positive (SS+) cases). Therefore, data from the 2012 cohorts are difficult to compare with data from previous years as the new definition is more inclusive (relapse and clinically diagnosed cases included) resulting in lower TSRs in some countries. Nevertheless, treatment success rates remain strong in most TB CARE I countries, with ten countries exceeding the 85% Stop TB target and five of those also surpassing the 87% USAID target. Improvements between 2011 and 2012 were noted in seven countries (Cambodia, Ethiopia, Kazakhstan, Namibia, Nigeria, Tajikistan and Uzbekistan). The successful treatment of 861,406 SS+ patients from 2010-2011 and 805,266 new and relapse patients in 2012 translates to a 65% achievement of the 2014 USAID target (2.55 million SS+ patients successfully treated over five years)⁴.

Five countries have surpassed the USAID treatment success rate target of 87%

The figure below illustrates TB CARE I country status towards achieving USAID targets (84% CDR and 87% TSR). TB CARE I countries are making progress, but major investments and innovative approaches are still needed to achieve the ambitious USAID targets.

Comparison of TB CARE I countries' case detection (2013) and treatment success (2012) rates to USAID targets* (WHO 2014)



*Kyrgyzstan is displayed at the bottom of the graph as no TSR is available for 2012 (2013 CDR: 91%).

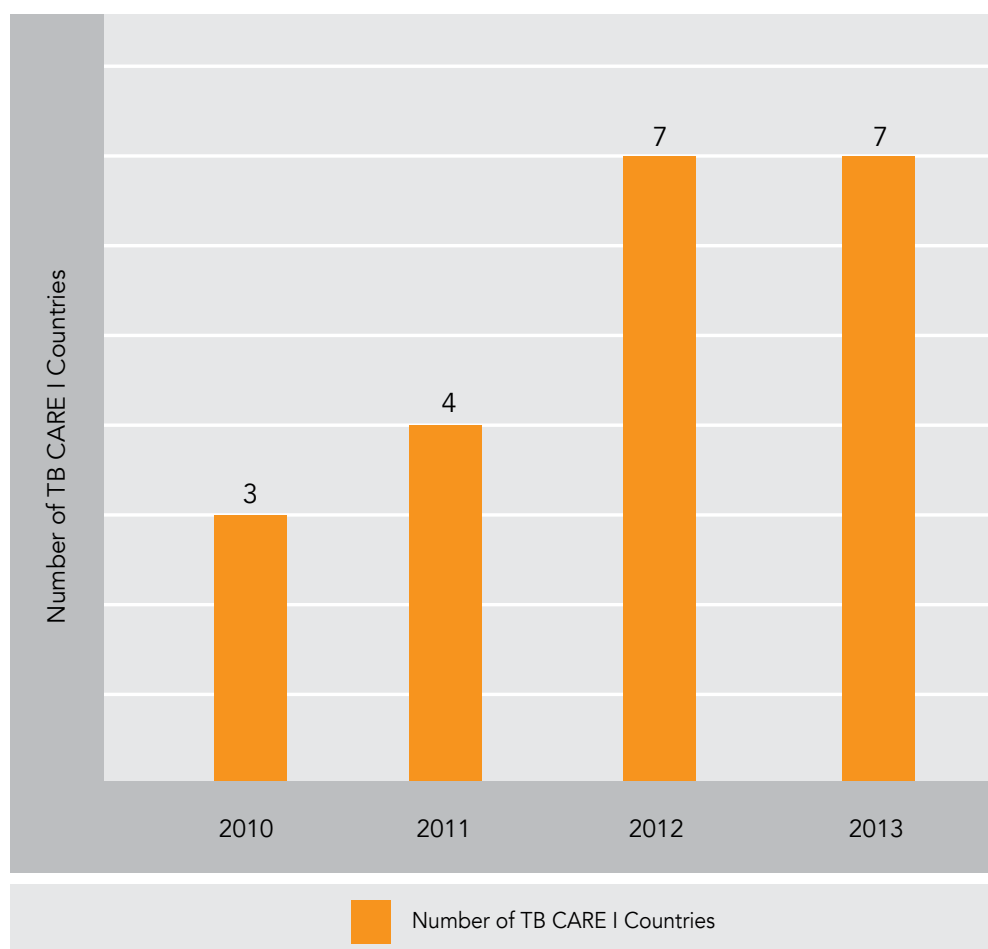
⁴ Although TB CARE I didn't start until October 2010, many patients who started treatment in 2010 were being managed and supported with TB CARE I support during the course of their six-month treatment period.

HEALTHCARE WORKER TB

Monitoring TB among healthcare workers (HCWs) continues to be a challenge in many countries, including TB CARE I countries. Of all countries reporting to the WHO, only 35% (75/217) reported the number of HCWs diagnosed with TB (all forms) in 2013. In comparison, 41% (7/17) of TB CARE I countries reported to the WHO the number of HCWs diagnosed with TB in 2013 (Botswana, Kazakhstan, Kyrgyzstan, Mozambique, Namibia, Tajikistan, and Uzbekistan). This is an improvement from only three TB CARE I countries (18%) reporting these data at baseline in 2010. Viet Nam, Zambia and Zimbabwe started monitoring the number of HCWs diagnosed with TB on a quarterly basis in selected TB CARE I supported sentinel sites, but have not reported these data to the WHO. Unfortunately, actual numbers of reported HCWs with TB are still very low (484 in 2013) suggesting that recording and reporting systems have to be further developed and that numbers are often still based on passive case finding or on subsets of HCW cadres (e.g. HCWs in TB facilities), not on annual screening of HCWs.

41% of TB CARE I countries reported to the number of HCWs diagnosed with TB to the WHO

TB CARE I countries reporting the number of HCWs diagnosed with TB annually to the WHO (n=17)



MDR-TB DIAGNOSIS & TREATMENT

The diagnosis and treatment of MDR-TB cases is accelerating in most TB CARE I countries. In 2013, 13,533 confirmed MDR-TB patients were diagnosed across 19 TB CARE I countries – a modest 2% increase compared to 2012, but a major leap (29%) from 2010 baseline (see **page 18**). Treatment initiation for MDR-TB improved considerably in 2013; 13,041 confirmed MDR-TB patients started on second-line treatment, which represents a 19% increase compared to 2012 and an 81% jump from baseline. However, what is also striking is the contribution GeneXpert MTB/RIF (Xpert) has had to drug-resistant TB (DR-TB) diagnosis and treatment (see **page 32** for more information on Xpert). In 2013, when totaling both confirmed MDR-TB cases and rifampicin-resistant TB (RR-TB) cases, 20,508 RR-/MDR-TB patients have been diagnosed, which is a 22% and 80% increase compared to 2012 and 2010 respectively. The number of confirmed and unconfirmed MDR-TB patients started on treatment in 2013 also grew considerably from 2010 (89%) and 2012 (21%).

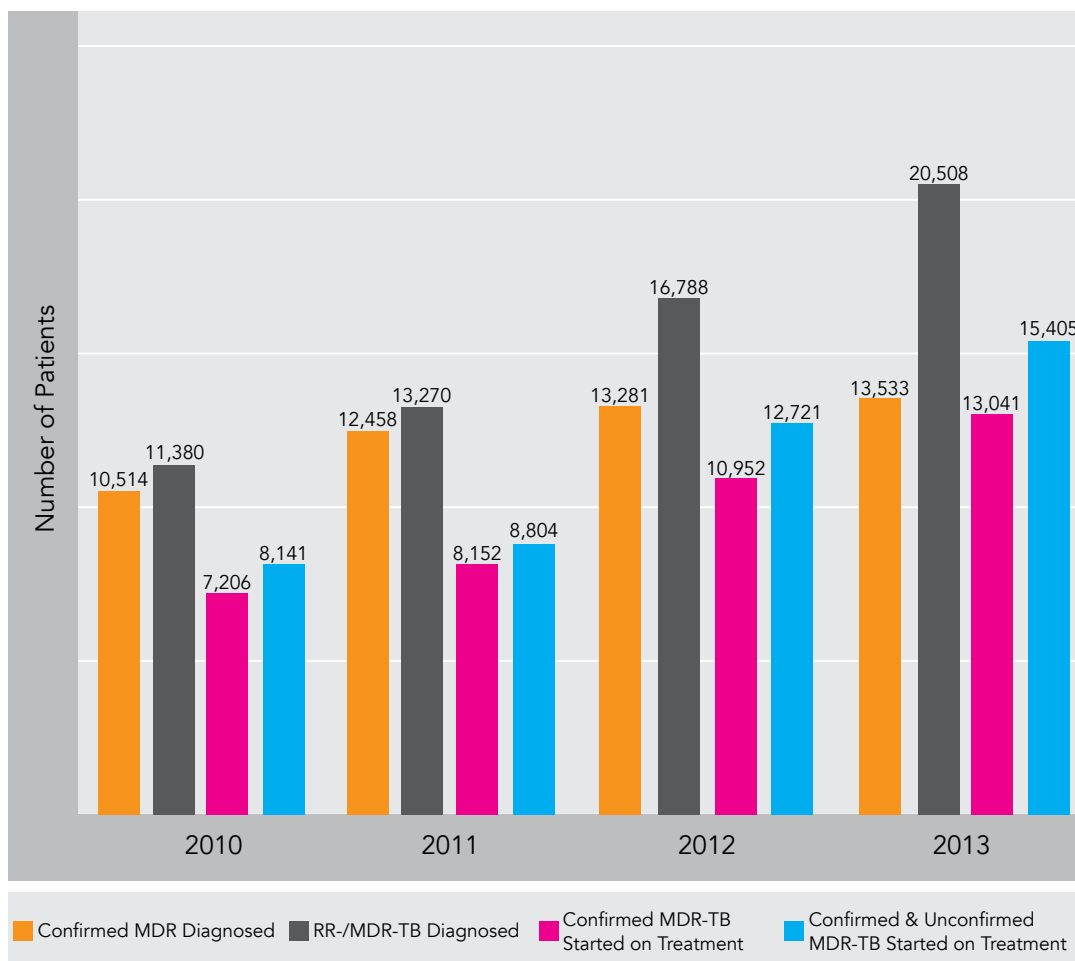
In 2013, 13,533 confirmed MDR-TB patients were diagnosed across 19 TB CARE I countries

Also of note is the narrowing gap between patients being diagnosed and starting on treatment, as can be seen in the figure on page 18. Although the cohorts of patients diagnosed and patients on treatment in 2013 are not necessarily the same (the treatment cohort may include patients diagnosed in the previous year), roughly comparing the groups shows a gap of only 4% in 2013 compared to 31% in 2010. As electronic systems for MDR-TB treatment monitoring and reporting develop countries will have greater capacity to track and respond to identified weaknesses in diagnosis, treatment initiation and successful treatment completion.

USAID set a target of diagnosing and starting on treatment 57,200 MDR-TB cases by 2014. Between 2011-2013, TB CARE I countries have contributed a total of 32,392 patients or 57% to the USAID target (65% if unconfirmed/RR-TB cases are also included in the total)⁵.

The Central Asian Republic (CAR) countries continue to contribute a significant portion of the number of MDR-TB patients diagnosed (82%) and started on treatment (80%) across all TB CARE I countries, however as the largest contributor, Kazakhstan's overall contribution is lower (45% of all confirmed MDR-TB cases) compared to the beginning of the project (70%). This indicates that diagnosis and treatment initiation are accelerating in other TB CARE I countries such as Ethiopia, Indonesia and Nigeria, where treatment initiation tripled, quadrupled and increased five-fold from 2010 respectively.

⁵ Djibouti and Dominican Republic have been included in the total number of cases started on treatment from 2011 and 2012 as they were active TB CARE I countries during this period.



Diagnosis of confirmed MDR-TB by culture/drug susceptibility testing (C/DST), diagnosis of confirmed RR-TB and MDR-TB (Xpert and C/DST), treatment initiation for confirmed MDR-TB, and treatment initiation for unconfirmed and confirmed MDR-TB, 2010- 2013 (WHO, 2014)

Data are from the same 19 TB CARE I countries (2010-2013)



TECHNICAL AREAS



TB CARE I TECHNICAL AREAS

In Year 4, TB CARE I implemented projects in 17 countries, spanning Africa (9), Central Asia (5) and South-East Asia (3). A small project was also implemented in Senegal, but does not have full-time staff or activities on the ground so is not included in the annual data analyses. TB CARE I's work spans multiple continents and contributes to improved TB diagnosis, treatment and care for the more than 810 million people living in the countries where the program works. The program operates in nine countries at the national level and/or across all regions, while in the remaining eight countries the program supports the national level as well as specifically assigned geographic areas or pilot zones. Across the 17 TB CARE I countries, roughly 71% of the population lives in TB CARE I-supported geographic areas.

Year 4 results are summarized in the following subsections by technical area (8). Programmatic data are collected by the project at country level while most population or patient-based data are extracted from the *WHO Global TB Report 2014*. Achievements and results from country, core and regional projects are also highlighted. More detail on country-level activities and results can be found in the **supporting data section** and in country-specific end-of-project reports, which will be released in December 2014.





UNIVERSAL ACCESS

- Increase the demand for, and use of, high quality TB services and improve satisfaction with the services provided
- Increase the quality of TB services delivered by all care providers
- Reduce patient and service delivery delays

17 Countries

6 Core Projects

2 Regional Projects

4851 People Trained



3088



1763

PATIENT-CENTERED APPROACH

TB CARE I implemented a core project to pilot the patient-centered approach (PCA) package⁶ and evaluate change towards improved patient-centeredness in five countries: Cambodia, Indonesia, Mozambique, Nigeria and Zambia. The results of the PCA pilot demonstrated that the tools provided practical approaches that enabled TB programs and health facilities to take steps to improving patient-centered care. In general the tools were found to be easy to implement, with the exception of the Tool to Estimate Patients' Costs, which required more training/direction. This costing tool was then revised based on the experiences from Ethiopia, Indonesia and Kazakhstan. The Patients' Charter was found to be a powerful tool to empower patients, based on pilot results. In four countries, patients became more aware of their rights and responsibilities, empowering them to demand better services, organize themselves and become involved in TB activities. An unexpected outcome was HCWs were empowered with new insight into the experiences and challenges faced by patients in accessing TB services. They were also provided with new tools to strengthen their important role in providing information and adherence support to TB patients. QUOTE TB Light and the Tool to Estimate Patients' Costs identified several barriers and quality of care issues, providing each of the countries with an evidence base to develop interventions for PCA improvements.

All five countries reported plans to scale up use of the PCA tools. Nigeria plans to integrate QUOTE TB Light into the NTP's supervision system. Nigeria and Zambia plan to train more HCWs on the Patients' Charter. Mozambique has also scaled up the use of the Charter and the TB/HIV literacy toolkit in 28 districts where TB CARE I supports community based DOTS (CB-DOTS) activities. They will also produce a TB flipchart for the literacy toolkit and a revised Patients' Charter with illustrations and simpler language. Indonesia has adapted the package to the country context and developed a strategy with practical Standard Operating Procedures (SOP), which will be supported by the Global Fund (GF).



⁶ The following tools (all available on the [TB CARE I website](#)) are included in the package: The Patients' Charter for TB Care and Control, QUOTE TB Light, Tool to Estimate Patients' Costs, TB/HIV Literacy Toolkit and a Practical Guide to Improve Quality of TB Services.

CHILDHOOD TB

In Year 4, TB CARE I has continued to invest in the quality diagnosis and treatment of TB in children in eleven countries (Afghanistan, Cambodia, Ethiopia, Indonesia, Kazakhstan, Kyrgyzstan, Mozambique, Nigeria, Tajikistan, Viet Nam and Zimbabwe). In 2013, 73,559 pediatric TB cases were notified to NTPs in TB CARE I countries. Although slightly lower than the 75,427 reported in 2012, pediatric cases made up 8% of all new and relapse cases with age information known, which is within the target range of 5-15% of all TB cases.

TB CARE I-Viet Nam continues to show positive results from its investment in childhood TB. In one quarter alone (April-June 2014) four TB CARE I pilot provinces registered a total of 1,059 child contacts and provided 259 children (24%) with isoniazid preventative therapy (IPT). Five percent of contacts (56) were diagnosed with TB. Based on the success of TB CARE I's strategy for the management of TB in children in Viet Nam, Dr. Nguyen Thien Huong (TB CARE I-Viet Nam's Country Director) was chosen as co-chair of the Western Pacific Regional Childhood TB Working Group.

Although not an established TB CARE I country, in Year 4 Somalia began receiving support from TB CARE I through regional funding for childhood TB technical assistance (TA). In a country with such major security concerns and no central government, the challenges of providing TB services – especially to children – are enormous. However, in less than one year the project has drafted a field guide for TB/MDR-TB in children, updated the child TB chapter in the Somali TB guidelines, and developed an implementation plan for child TB activities. In addition, seven Somalis (three pediatricians, three TB program staff and one TB Unit hospital head) were funded to attend the childhood TB course being conducted at the Center of Excellence in Rwanda (see [page 47](#) for more information). These participants will play a key role in scaling up childhood TB services in country, as well as disseminating and implementing the key documents developed in collaboration with TB CARE I.



COMMUNITY-BASED INITIATIVES

TB CARE I continues to make significant investments in community-based activities, with activities ranging from engaging local organizations to conduct community-based DOTS activities to the development of community-focused guidelines at the national level. In Year 4, 13 TB CARE I country projects invested in community-based work to some capacity (Afghanistan, Botswana, Cambodia, Ethiopia, Kazakhstan, Kyrgyzstan, Mozambique, Namibia, Nigeria, South Sudan, Tajikistan, Uzbekistan, Zambia and Zimbabwe).

In Botswana, TB CARE I supported a research project on the evaluation of community TB care (CTBC). The results of the study will guide the NTP/MoH to adopt an appropriate CTBC approach to be scaled up, taking into consideration the future decline in donor funding. CTBC approaches using incentivized volunteers were deemed the most effective and of high quality, despite sustainability concerns. CTBC approaches managed by civil society organizations (CSOs) were noted to be very effective for hard to reach populations.

Several operations research studies have been conducted by TB CARE I on community-based initiatives (see **page 63** for more details). One key study in Cambodia compared referrals from CB- DOTS watchers and private providers using the classic referral strategy based on TB symptoms versus an enhanced referral strategy targeted at high risk groups (smokers, diabetics and people >55 years). Referral over a six month period was statistically significantly higher in the intervention arm (2,242 or 7.7 referrals/trainee) than the control group (883 or 4.7 referrals/trainee). Referrals from the intervention arm were more likely to be children under 5, diabetics or smokers, but there was no difference in proportion of elderly referred. Ninety-one percent (404/445) of TB cases detected in the intervention arm were attributable to referrals, compared to only 51% (175/345) of TB cases in the control villages.



TB IN PRISONS

Building on Year 3 investments, the program worked to improve the diagnosis, treatment and care of prisoners or prison staff with TB in seven countries (Cambodia, Ethiopia, Indonesia, Kazakhstan, Mozambique, Nigeria and Zambia). In Indonesia, TB CARE I successfully expanded into 16 new prisons in Year 4, bringing the total number of prisons/detention centers (DCs) implementing DOTS and TB screening to 41 (exceeding the target of 35 prisons). As a result of TB CARE I support, 89% of released inmates were successfully transferred to their referral health care facilities and continued their treatment; 99% of inmates with HIV were screened for TB. A total of eight prisons/DCs successfully implemented cough surveillance to strengthen TB case finding. This is a part of the FAST strategy (Finding cases Actively, Separating them safely and Treating them effectively) - to detect early, separate and treat immediately inmates with TB (see [page 42](#) for more information on the FAST approach). Cough surveillance resulted in identification of eight inmates with TB; one HIV infected inmate was diagnosed with RR-TB via Xpert. All 35 prisons/DCs supported by TB CARE I now have access to Xpert.



PUBLIC-PRIVATE MIX

In Year 4, TB CARE I implemented public-private mix (PPM) activities in six countries: Afghanistan, Botswana, Cambodia, Indonesia, Namibia and Nigeria. With the exception of Namibia where TB CARE I PPM work has been limited to operations research, the five other countries reported 3,090 private providers collaborating with the NTP in Year 4. This number was an 80% increase over Year 3 (1,712) and an 84% increase over Year 2 (1,675) totals. Focusing on TB CARE I-supported areas in these five countries reveals a major increase in cases diagnosed by private providers. In Year 4, 33,666 TB patients were notified by private providers – a more than 2.5 fold increase from Year 3 (12,589) and a five-fold increase on Year 2 notifications (6,415).

In Afghanistan, urban DOTS, a strategy that engages public and private health facilities in TB control, was introduced in Kabul in 2009 under TB CARE I's predecessor, the Tuberculosis Control Assistance Program (TB CAP). Since that time TB CARE I has continued to expand and strengthen the Urban DOTS approach; the number of public/private health facilities engaged with the NTP in Kabul increased from 22 in 2009 to 80 in 2014. From 2009-2013, the number of presumptive TB cases identified/examined at the health facilities increased five-fold (2,856 to 14,181), the number of TB cases (all forms) notified increased by 84% (1,934 to 3,548) and TSR jumped from 44% (2009) to 76% (2012).



INTERNATIONAL STANDARDS FOR

Tuberculosis Care

DIAGNOSIS TREATMENT PUBLIC HEALTH



International Standards for Tuberculosis Care 3rd Edition

The International Standards for Tuberculosis Care (ISTC) describes a widely accepted level of care that all practitioners, public and private, should seek to achieve in managing patients who have or are suspected of having TB. The Standards are intended to facilitate the effective engagement of all care providers in delivering high-quality care. TB CARE I played a critical technical and financial role in the development of the third edition of this essential document. Development of the revised edition was led by the WHO and ATS, with input from an expert committee of 27 members from 13 countries. The final version was reviewed and approved by all the TB CARE I Coalition partners before being published in March 2014.

New to the third edition is a free mobile phone application that features clinical decision algorithms with step by step guidance for diagnosing and managing TB, along with the full text of the ISTC. The application is designed to be used by TB practitioners, and provides them with all the essential information for diagnosing and managing TB.



As an important step towards effective dissemination and use of the ISTC, a two-day meeting was organized in Indonesia in September 2014 bringing together representatives of national professional associations and NTPs from six countries with larger private health sectors (Bangladesh, India, Indonesia, Myanmar, Pakistan and the Philippines). The meeting provided a platform for the NTPs and national professional associations to come together, identify and discuss barriers to enhancing collaboration, and outline plans for expanding the role and contribution of national professional associations in TB care and control. These plans will inform and feed into the development and/or implementation of PPM interventions incorporated into Global Fund concept notes of participating countries.

OUTPATIENT TB TREATMENT MAKES RECOVERY EASIER

In Kyrgyzstan, where the prevention, detection and treatment of TB is a major public health concern, new methods of patient-centered care are being developed to combat the disease. With the support of the TB CARE I project, the Kyrgyz National TB Program has begun piloting full outpatient care, allowing TB patients to be treated without hospitalization. The pilot is taking place in the urban setting of Bishkek city, where the approach is proving to be very effective.

Aizada Abdykadyrova, a young mother and former TB patient, moved from her native Naryn to Bishkek as a child. At the age of 15, she dreamt of becoming a model. After becoming ill with what she initially believed was pneumonia, Aizada was subsequently diagnosed with TB. The diagnosis was devastating, and despite pleas to be cared for at home, she was admitted for treatment at the hospital - a deteriorating, government-run TB facility, where she was denied access to her loved ones. After several months of treatment, Aizada was discharged and she returned home. Although she tried to put the experience behind her, the emotional and physical scars remained.

She later learnt English and eventually she moved to Dubai to work in fashion retail, ultimately returning to Kyrgyzstan to get married and have a child. When Aizada next went to Dubai - this time as an immigrant worker - she lived in a small room with seven other women in order to save money. During a routine health assessment, two of her Filipino coworkers were diagnosed with TB, which led to a full workplace screening. Aizada received the crushing news that she too had again contracted the disease and she was immediately deported.

As Aizada recounts the story, she is clearly still upset: "You can't even begin to imagine how shocked I was to hear the news. It broke my heart to think I'd have to relive the trauma of that experience all over again."

Back in Bishkek, she went to the city TB center for treatment. As she choked back painful memories of her previous treatment and the isolation she experienced, to her surprise she was informed that the facility was part of a pilot project that advocated for outpatient care. No longer would she have to be separated from her family or suffer through the shame and trauma of protracted hospitalization; she could enjoy the convenience, safety, and anonymity of outpatient treatment.

"The community nurse who oversees my treatment is wonderful. She ensures that I take my medication and never alters our routine of care."

In contrast, Aizada remembers that during her first hospitalization:

"The personnel were never strict about adhering to treatment and often gave me pills to take on my own."

Aizada says that the opportunity to get excellent, supervised treatment close to home, has made it far easier to cope with the disease, and has led her to full recovery. When learning that this new process was being piloted by TB CARE I project with the hope of universal availability, she pledged her support. "I've never concealed my TB story, in fact, I wish more patients knew they had the kinds of options for treatment that make full recovery easier. Perhaps my voice can strengthen the call on authorities to widen the practice of outpatient care."

Today, Aizada is exploring new avenues to influence decision makers. In collaboration with the Kyrgyz National Red Crescent Society, which received funding to empower former TB patients as activists, she is eventually hoping to become a Global Fund Country Coordinating Mechanism member. With strong people like Aizada, there is hope that the necessary changes in healthcare policy will become a reality in Kyrgyzstan.



LABORATORIES

Ensure capacity, availability and quality of laboratory testing to support the diagnosis and monitoring of TB patients

Ensure availability and quality of technical assistance and services

Ensure optimal use of new approaches for laboratory confirmation of TB and incorporation of these approaches in national strategic laboratory plans

15 Countries

9 Core Projects

1 Regional Project

2498 People Trained



1257

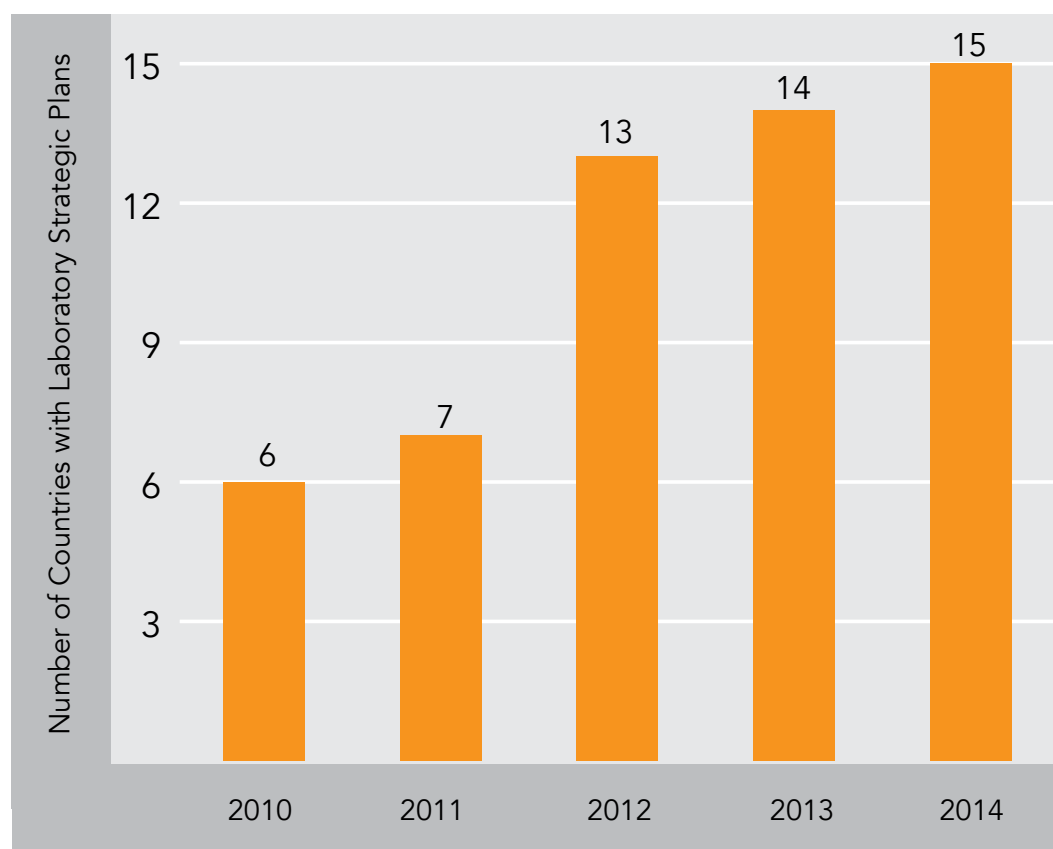


1241

LABORATORY STRATEGIC PLANS

Over the past year strong efforts have focused on completing National Strategic Plans (NSPs) that would inform GF concept note (CN) development. Many TB CARE I countries have developed National Strategic Plans (NSPs) with TB CARE I support, which include laboratory developments prioritized through previously written Laboratory Strategy Plans (LSPs) supported by TB CARE I technical assistance. These plans have been a critical component for Global Fund to Fight AIDS, TB and Malaria (GFATM) concept note writing as they provided the necessary gap analyses and structured development for capacity building and expansion to increase access to diagnosis for TB and DR-TB. All but two supported countries have LSPs that will enable NTPs to efficiently and effectively coordinate, implement and budget lab activities over the next round of GFATM funding (see below). At least 10 of the countries with LSPs have an allocated budget for activities and are in the process of implementing these activities. The development and utilization of the new tool ***Practical Handbook for National TB Laboratory Strategic Planning*** played a significant role in providing awareness of the need for such planning and special guidance on “How to” initiate the steps to identify needs and carve out a long-term path for national TB laboratory network development.

Number of TB CARE I countries (n=17) with laboratory strategic plans



SUPRANATIONAL REFERENCE LABORATORIES

In addition to strategic planning for laboratories, new linkages have been established between national reference laboratories (NRLs) in TB CARE I countries and supranational reference laboratories (SNRLs). At present, all countries (17/17) have developed SNRL linkages with at least one on-site visit in Year 4. SNRL linkages are important for long-term sustainable assistance from an external supervisory lab, which can provide mechanisms for proficiency and quality assurance assessments. In addition, these linkages are important as they provide expertise needed to advance NRL technologies, provide support for surveillance activities, fill gaps in second line drug sensitivity testing (DST) and whole genome sequencing, assist with implementation of LSPs, and provide continuous mentoring capacity.

One of the major additions that has made this possible was the accreditation of the Uganda SNRL, which has provided support to 10 countries (Somalia, South Sudan, Eritrea, Kenya, Swaziland, Lesotho, Tanzania, Rwanda, Burundi and Zambia) with services that include TA for various lab activities, External Quality Assurance (EQA) and proficiency testing, DST and sequencing. It has formed linkages with seven of those countries to date. The Uganda SNRL is currently being proposed as the major SNRL for the East, Central and Southern Africa (ECSA) member states and neighboring regional countries. The 6-year investment by USAID in the Uganda SNRL has made it possible for this new SNRL to take on a supportive leadership role to regional NRLs. Its primary activities are focused on providing regional long-term consistent TA and mentoring for newly developing NRLs, as well as supporting further capacity building efforts and training for the expansion of DST to diagnose DR-TB. In addition, the SNRL can assist NRLs with implementing quality management systems (QMS) which will lead the way towards NRL accreditation. Over the past year SNRL has developed its own business plan with TB CARE I support and is moving towards functioning autonomously. At the present time the Uganda SNRL has joined with ECSA to submit a *GFATM Regional Concept Note* in order to gain a new source of funding to extend its support and continue efforts to assist the region. The Global Fund new funding mechanism (NFM) may provide additional resources to implement the new business plan while linking countries to make services sustainable. In October, all ECSA member states plus additional neighboring country NRL/NTP program managers participated in a three-day meeting to identify gaps and strategies for SNRL Uganda to support regional lab developments and strengthen regional lab capacity.

IMPLEMENTATION OF GENEXPERT MTB/RIF TECHNOLOGY

One of the greatest undertakings of TB CARE I has been the rollout, strategic implementation, and expansion of Xpert throughout all TB CARE I countries. Although the level of investment and TB CARE I project role varies from country to country, these efforts began with training and procurements, and then extended to providing extensive mentoring, supervision, and monitoring activities. As time progressed, challenges were identified by all program partners and implementers that required specialized TA in areas of supply and distribution logistics and management, development of strong maintenance and waste management plans, as well as devising and implementing strong data capture systems to ensure effective and efficient recording and reporting. Further efforts were made in collaboration with country partners and implementers to enhance uptake and utilization of the testing by focused training programs for clinicians and program managers. Intensified trainings followed intensified scale-ups, which exponentially increased testing and thus improved rapid case detection for both TB and MDR-TB. A critical component to Xpert rollout was to initiate a strategic plan for country implementation that was addressed at a programmatic level in order to ensure uniform practices and proper application of the test. TB CARE I technical assistance was provided in several countries to work collectively with national programs at scoping out phased strategies of implementation and the development of national guidelines. This included evaluating each country's situation and epidemiology to address the priority populations for testing. Most countries follow WHO recommendations testing presumptive MDR-TB cases and people living with HIV (PLHIV) presumptive for TB. However, some countries have adapted algorithms to test all cases of TB which include children and extrapulmonary TB. The data below provide a summary of success from TB CARE I support in procurement, implementation, operations, testing activities, turnaround times (TATs) and linkages to treatment as TB CARE I rolled-out Xpert.

FAST FACTS

TB CARE I supported the procurement of nearly 25% of the operational instruments in TB CARE I countries by the end of Year 4 (101/439).

Over 44,000 Xpert MTB/RIF cartridges were procured to support country activities.

Training, Technical Assistance and Mentoring were provided to 14 out of 17 countries.

Total number of successful tests completed in 4 years = 114,699

└ Total number TB positive cases detected by Xpert = 39,398 (34% positivity rate)

└ Total TB positives with rifampicin resistance = 10,060 (26% RIF-resistance rate)

XPert IMPLEMENTATION/ OPERATIONS

TB CARE I has identified key steps to the successful rollout of Xpert in a country. The program has been tracking progress in each TB CARE I country against these milestones since Year 3. The table below summarizes successful aspects of implementation and continued challenges across the 17 current TB CARE I countries.

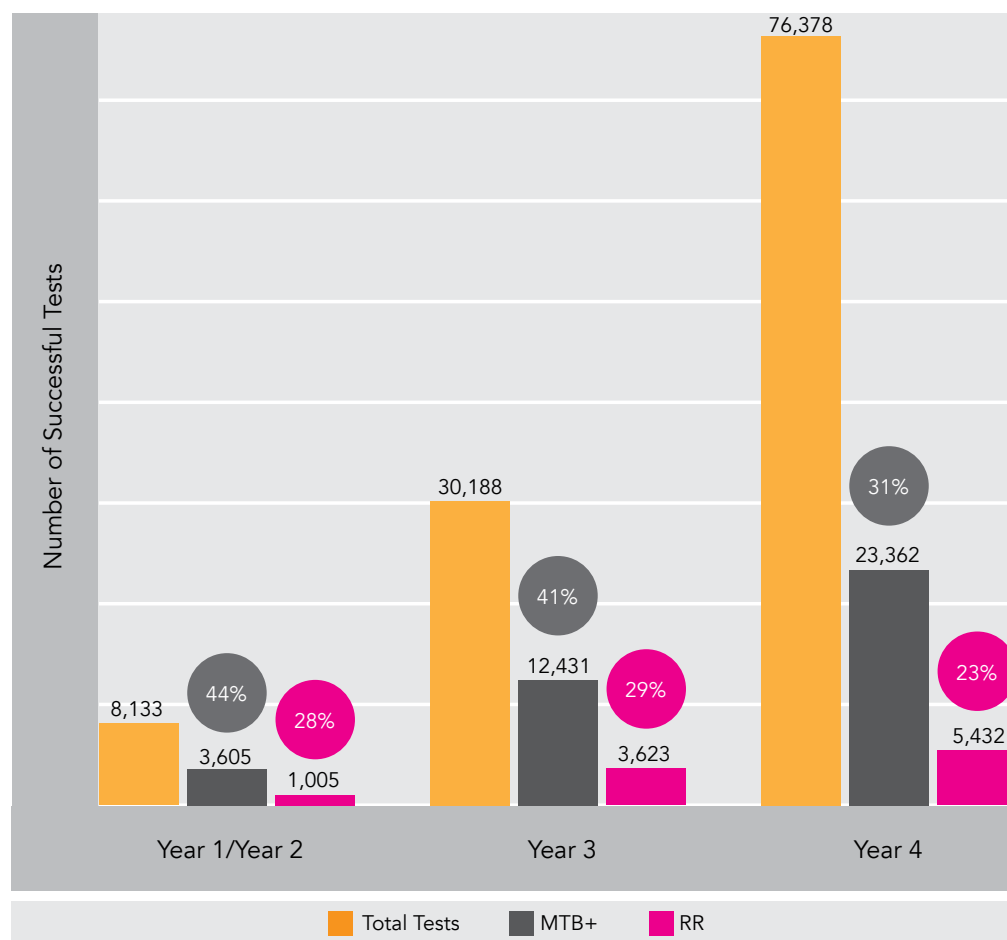
The percentage of TB CARE I countries (n=17) that have completed or are in the process of implementing practices for effective Xpert implementation/operations

IMPLEMENTATION	%
Xpert Working Group in place	88
Strategic Plan for Xpert Implementation	88
Sites assessed and prepared before installation	80
Proper SOPs in place	82
Nationally approved diagnostic algorithm	82
Xpert maintenance plan devised and implemented	71
Waste management plan implemented	59
Recording and Reporting tool updated	82
OPERATIONAL	%
Annual consumption and forecasting	82
Cepheid service provider contracted*	50
Adequate rates for monthly utilization (160-240 test/mo)	24
Regular supervision visits to assess quality practices	71
Systematic data collection for programmatic surveillance	65
Error rates <5%*	80
Have machines needing calibration	41
Performing impact assessments	47
Implementing EQA	53
Expansion plan	82

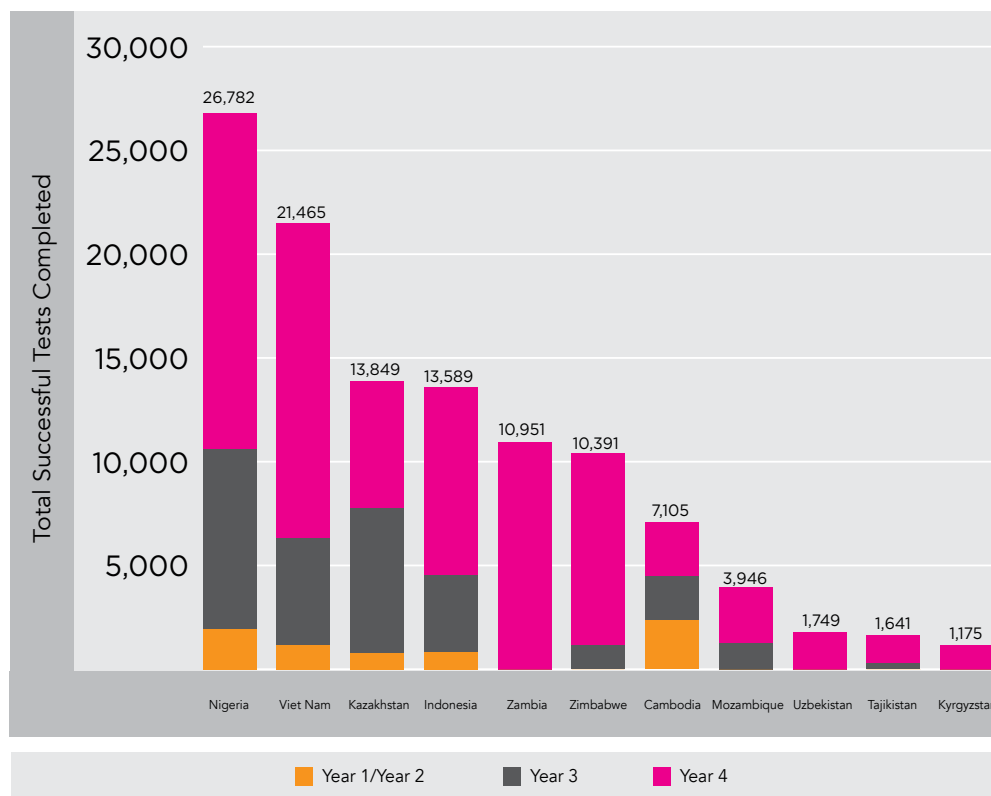
* Determined only from countries that provided data.

The figure below summarizes TB CARE I-supported Xpert testing from Years 1-4. Since the start of TB CARE I, 114,699 TB CARE I-supported tests have been conducted with a TB positivity rate of 34% and RR-TB detection rate of 26%. Testing jumped by 153% from Year 3 to Year 4 alone; 88% more samples in Year 4 detected TB (MTB+) than in Year 3 (50% more RR-TB was diagnosed).

Summary of TB CARE I - supported Xpert testing activity over four years of implementation, including TB positivity rate and RIF-resistance rates



The figure below summarizes Xpert rollout over four years of implementation in TB CARE I countries with the largest investment in Xpert. The graph illustrates the acceleration in Xpert testing conducted in TB CARE I supported sites from Years 1-4.

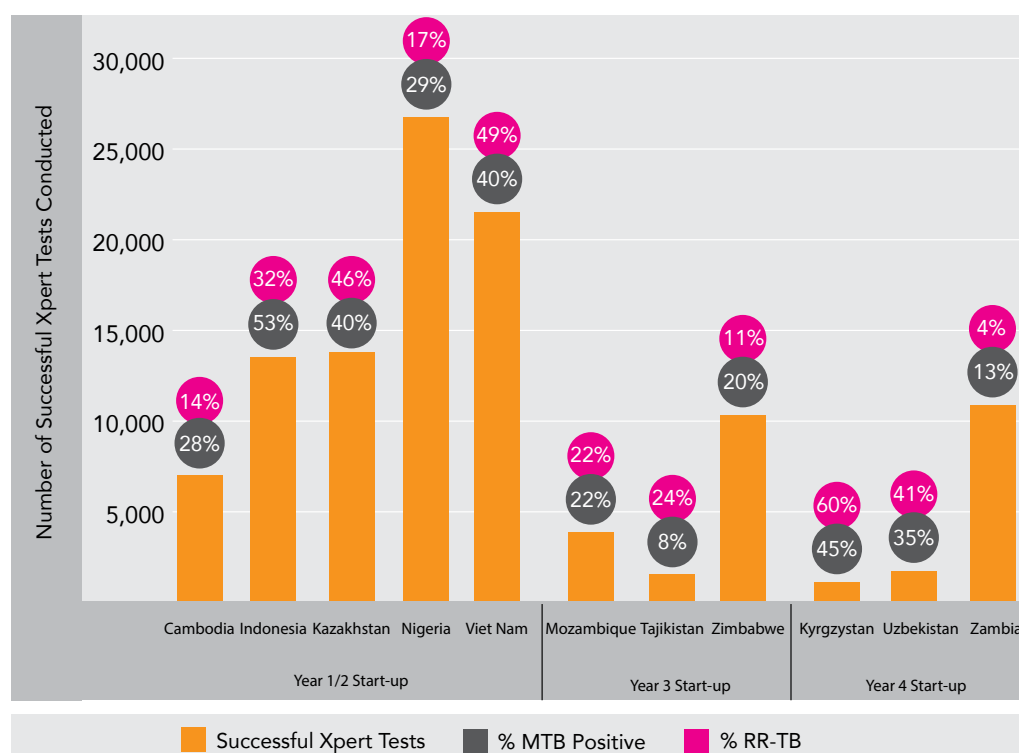


Total successful Xpert tests conducted in TB CARE I-supported sites, Year 1-4*

*Data only shown from countries where TB CARE I has had moderate/substantial investment in Xpert. Ethiopia is not included in the graph as complete Year 4 data were not yet available.

Rates of TB and RR-TB case detection vary depending on country diagnostic algorithms. Some countries focus testing on presumptive MDR-TB cases while others test PLHIV presumptive for TB, all TB presumptive cases, or have added presumptive extrapulmonary to their algorithms. Countries such as Nigeria, Indonesia, Viet Nam and Kazakhstan have higher testing numbers as these countries were the first to implement the technology under TB CARE I.

Country-specific Xpert rates of TB and RR-TB case detection by year of TB CARE I-supported Xpert start up



EXPANSION OF QUALITY MICROSCOPY

Throughout both TB CAP and TB CARE I mechanisms, quality microscopy has been a major focus. Expanding services to improve access, implementing LED microscopy, and working to build strong foundations for quality assurance are a continued focus as microscopy networks remain one of the essential tools used to screen for TB and follow-up patients on treatment in limited resource settings. At present all countries have implemented EQA programs for microscopy with 12/17 countries having >75% EQA coverage. The performance level for EQA in all but one country is above 80%.

TB CARE I has provided major support for EQA programs over the past four years. When evaluating the progress of these programs it is important to understand the country situation. For example in South Sudan (a major conflict zone with severe challenges), where microscopy is the only tool for diagnosing TB, continued TB CARE I support has helped to sustain activities. Even though coverage for EQA is limited (25%), the quality has been maintained at a performance of >85%. In Mozambique, a substantial amount of support has been provided to improve the national microscopy and EQA program over the past year. The program increased both in the number of microscopy examination centers from 114 to 232 (doubled) and improved EQA coverage from 39% to 60%. Maintaining quality microscopy is extremely important, as it is not only used for the initial screening for TB, but it remains the primary tool for monitoring the response to therapy. Thus, as we move forward with new rapid molecular diagnostics for case detection, we must continue to support and maintain the quality of microscopy as it continues to be a necessary tool for patient management and care.



CORE PROJECT HIGHLIGHTS

In Year 4 of TB CARE I, there were several additional global/core projects focused on the development of important tools for TB laboratory staff and consultants, or expanded diagnostic capacity through the implementation of Xpert. Key core laboratory strengthening projects are summarized below

All tools/publications are or will be available on the TB CARE I website:

<http://www.tbcare1.org/publications/toolbox/lab/>

QUALITY PERFORMANCE INDICATORS FOR TB LABORATORIES

The project was designed to identify indicators for TB laboratory testing performance. These indicators are designed to assist laboratory with regular internal quality monitoring for all laboratory testing. Monitoring and evaluation of quality performance laboratory indicators (QPI) is an essential element of quality improvement component of a QMS. A total of 32 QPIs have been identified in the technical areas of microscopy, culture, DST, line probe assays (LPA), Xpert, media preparation and sputum collection processes. In addition, the project devised an outline for the development of a handbook on QPIs, which is to include descriptions of primary and secondary indicators, guidance on troubleshooting, and references. The list of indicators will be published on the TB CARE I website in 2015.

STANDARD OPERATING PROCEDURES FOR ADVANCED METHODS IN TB CULTURE AND DST

A uniform and updated set of SOPs have been designed for solid DST methods, Xpert, LPA methods, MGIT960 culture and DST methods, and MTB identification by immunochromatographic strip tests. To be posted on the TB CARE I website in December 2014.

TB LABORATORY CONSULTANT'S MANUAL

This manual is intended to familiarize TB laboratory consultants with WHO recommendations, harmonize input from the technical partners while staying in line with WHO policy, and outline the crucial steps in the provision of technical assistance. The manual will be published on the TB CARE I/Global Laboratory Initiative (GLI) websites in 2015.

MICROSCOPY NETWORK ACCREDITATION TOOL

The recently published **Microscopy Network Accreditation Tool** is designed to assess laboratory networks to ensure that conditions, resources and quality assurance are adequate to guarantee overall good results. Accreditation evaluation is based on 12 quality standards. In Year 4, two junior consultants were trained on how to use the tool and assessed two country microscopy networks (Benin, Cambodia).

XPert IMPLEMENTATION LINKING HIV/TB (PEPFAR COLLABORATION)

TB CARE I supported Xpert MTB/RIF implementation and training programs in four targeted countries: Zambia, Ethiopia, Zimbabwe and Nigeria in order to intensify TB case finding among PLHIV. The core project provided an opportunity for the NTPs to provide technical support, capacity building and monitoring of activities during the roll out of Xpert. All projects provided extensive technical assistance to develop implementation strategies which included; (1) designing a national training program to train a cadre of trainers, lab staff, and clinicians on Xpert, (2) establishing SOPs and defining country specific algorithms, (3) supporting the development of essential components for optimizing operations and enhance utilization, (4) improving strategies for cartridge management, (5) establishing maintenance and calibration services, (6) implementing essential specimen referral linkages, (7) devising supervision activities to monitor quality of testing as well as (8) building an M&E program necessary to collect data and assess impact of the new technology. See **page 53** for more information on the Nigeria and Zimbabwe projects.

BENIN SRL STATUS

The Benin NRL has become an advanced level laboratory quality management system particularly in terms of biosafety standards, SOP finalization and supply management standards to achieve SNRL status and start the application process for ISO 15189:2012 accreditation. Over the past year the NRL demonstrated improvement, commitment and dedication to obtaining SNRL accreditation. The QMS is in its final implementation phase. Biosafety, client and quality manuals are written and SOPs implemented. An internal auditing system is currently in place which is guiding the labs quality improvement phase. A mock accreditation assessment will be carried out in December by the Institute of Tropical Medicine (ITM) Antwerp in preparation for the official accreditation process expected in 2015.

NEW HANDBOOK FOR SPUTUM MICROSCOPY

The **Laboratory Diagnosis of Tuberculosis by Sputum Smear Microscopy** is a guide which incorporates traditional and newer technologies was published in 2014. The guide is designed to assist technicians with current microscopy strategies to screen for TB. The handbook uses simple text and clear illustrations to assist with understanding important technical components involved in conducting sputum smear examinations.

XPERT TRAINING PACKAGE

The **Xpert Training Package** is a training course designed for HCWs (including laboratory officers, clinicians and TB program staff) involved in implementation of the Xpert MTB/RIF assay. The purpose is to provide the knowledge and skills necessary to; (1) perform the Xpert assay in an accurate and reliable manner, (2) use the Xpert results for proper management of TB patients, and (3) plan and monitor implementation. The training packages consist of PowerPoint training modules with customization guidelines, participant and facilitator guides, materials to perform and facilitate an effective training program, exercises and instruction for lab practical trainings, and reference material to support each module.

GLOBAL FORUM ON XPERT MTB/RIF IMPLEMENTATION

The Xpert Global Forum took place on May 1-2, 2014 in Geneva, Switzerland as part of the 6th GLI Partners' Meeting. Several country programs and other international partners provided updates on Xpert rollout and expansion activities, lessons learned, technical updates on maintenance and calibration issues, and use and challenges associated with testing specimens from children and extrapulmonary presumptive TB cases.



SPUTUM TRANSPORTATION IN ZIMBABWE - REVOLUTIONIZING TB DIAGNOSIS

A reliable and efficient system for the referral of specimens is essential for effective patient care. This is especially important in the context of TB for the initiation of treatment and for patient follow up. Despite significant investment in the infrastructure of TB laboratories in Zimbabwe in recent years, most rural communities remained out of reach of laboratories where TB microscopy was performed. This situation was compounded by the lack of a transportation system for TB specimens (sputum), resulting in most patients being referred to the nearest diagnostic centres at their own expense. This posed a significant barrier in access to care. In response, the USAID-funded TB CARE I project successfully piloted and scaled up a dedicated specimen transportation (ST) system that is designed to improve access to laboratory services.

In 2010, in partnership with Riders for Health, TB CARE I launched a ST system in three major cities: the capital city of Harare; Bulawayo, the second largest city in the country; and Chitungwiza. The system transports sputum samples and other specimens that require laboratory investigation, using motorcycles to bring the specimens to the nearest diagnostic centre on a daily and/or weekly basis, depending on the geographic location. The riders also deliver the results back to the referring health facility. Following the successful completion of the three-city pilot project, the ST system was scaled up to 24 districts with support from TB CARE I. It currently consists of a total of 42 motorcycles, which serve 649 health facilities, over 40% of the country's health establishments.

The ST system has improved access to laboratory diagnostics. In 2010, 38,663 specimens were transported using the system. This figure grew to 176,981 specimens in 2013 (see graph), representing a four-fold increase. The proportion of TB specimens transported ranged from 44% in 2010 to 24% in 2013. The increasing

proportion of non-TB specimens transported represents a notable contribution to overall health systems strengthening.

The turnaround time from sputum collection to receipt of results declined dramatically. Prior to the ST system, two to three weeks elapsed from sputum collection to diagnosis in remote rural districts; the turnaround time in these areas is now down to only seven days. In urban settings, only one or two days are needed.

The gold standard for TB diagnosis in Zimbabwe is sputum investigation with AFB microscopy. The percentage of new pulmonary TB cases without initial smear investigations plummeted from a high of 19% in 2010 to 9% in the first half year of 2014. As the transport system also carries follow up sputum samples for treatment monitoring, the cure rate also improved from 71% in 2010 to 75% in the first half of 2013.

An important outcome of the transport system has been renewed trust in the health care system by the communities that it serves. Trust is essential for positive health care seeking behavior, a fact often recounted by patients and health care workers during TB CARE I site assessments:

"I had sputum positive TB in 2003 and I was successfully treated. But early this year, I had a chronic cough for 3 weeks, and I thought that I had TB again so I submitted my sputum samples and within 24 hours, I had my results. Luckily, it was negative. Thanks to this service many TB patients are going to be diagnosed and treated on time before they become too sick." Presumptive TB client Kuwadzana clinic, Harare city.

The system is also contributing to improved access to appropriate care by ensuring that specimen collection from health facilities is more reliable and is done in a timely manner, thereby reducing delays in diagnosis.



INFECTION CONTROL

- Increase TB-IC political commitment
- Scale up the implementation of TB-IC strategies
- Strengthen TB-IC monitoring and measurement
- Improve TB-IC human resources

16 Countries

1 Core Project

1 Regional Project

1916 People Trained



1075



841

INCREASED TB-IC POLITICAL COMMITMENT

Compared to only 50% of TB CARE I countries at 2010 baseline, all TB CARE I countries have now developed national TB-IC guidelines. Developed this year with TB CARE I support, the TB-IC guidelines in Kazakhstan are expected to receive Ministry of Health (MoH) approval by the end of the calendar year.

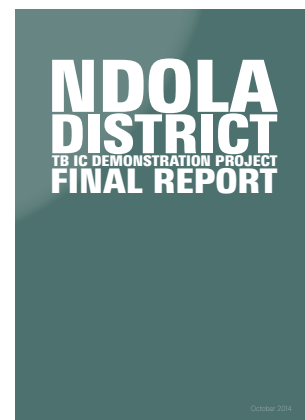
In addition, TB-IC is also incorporated in the overall national infection prevention and control (IPC) policy of all TB CARE I countries. In Ethiopia, TB CARE I provided assistance for the development of building design and engineering standards of healthcare facilities for the prevention of airborne infections. Ethiopia now has complementary regulations on the building design of healthcare facilities to prevent the transmission of airborne infectious diseases, including TB – only the second country in the Sub-Saharan African region (after South Africa) to have these important regulations.

SCALED-UP IMPLEMENTATION OF TB-IC STRATEGIES

TB CARE I continued to invest in facility level TB-IC implementation by offering training to facility level staff, TA for facility risk assessments and the development of facility IC plans, provision of commodities such as surgical masks, respirators and fans, and the completion of minor refurbishments. In Year 4, 14 TB CARE I countries reported TB-IC implementation in 479 healthcare facilities, almost the same number of facilities as in Year 3 (474). TB CARE I Afghanistan invested the most in facility level TB-IC implementation supporting 120 healthcare facilities.

Ethiopia, Nigeria, Zambia and Viet Nam piloted the FAST strategy (**F**inding cases **A**ctively, **S**eparating them safely and **T**reating them effectively). The FAST strategy assumes that getting TB patients on effective (Xpert or DST-based) treatment faster will reduce the transmission of TB, long before the conversion of sputum smear or culture to negative. Preliminary data from the pilots in Zambia and Nigeria show a reduction in the average time to diagnosis and time to treatment and an increased level of case detection. Based on these findings from 12 tertiary facilities in six states, Nigeria has included the FAST strategy in the revised national TB-IC guidelines.

Starting in Year 4, TB CARE I began a regionally-funded project in Somalia to improve TB-IC in the country by building the capacity of the TB program at the national and zonal level. A training of TB-IC trainers was conducted in October at the Center of Excellence (CoE) in Rwanda, bringing together 15 participants from Somalia (12 funded by TB CARE I). Laboratory technologists, medical doctors, nurses and engineers/architects from each of the three zones of Somalia as well as from the national level were trained. A key deliverable from the training was the development of laboratory SOPs for TB-IC. A total of 20 laboratory SOPs were adapted from the **TB CARE I Laboratory Tools** for use in the Somali laboratory network. The training participants will be leading cascade trainings for their zones, during which these SOPs will be introduced and implemented with support from partners in the country.



Spotlight: Case notification rate among HCWs at Ndola District TB-IC demonstration site

Over the past two years, TB CARE I implemented a core-funded project in 15 healthcare facilities in Ndola District, Zambia, to establish a demonstration site for safe work practices on the basis of TB-IC principles reducing TB transmission among PLHIV and HCWs. In one year (May 2013-April 2014), 61% (1,074/1,757) of HCWs (which includes TB treatment supporters) were screened by a screening clinician or nurse. An analysis of 2013 data showed the total number of cases diagnosed and notified through active case finding among HCWs was 18 out of 1,757 HCWs. This shows a notified TB incidence among HCWs of 1.02% (95% CI 0.6-1.6). When corrected for age, the case notification rate (CNR) ratio among HCWs compared to the general adult population of Ndola District was 1.05 (95% CI 1.02/0.97) suggesting TB-IC has been correctly implemented according to the WHO recommended proxy indicator.

Screening tools (forms and registers) are available on the TB CARE I website.



PMDT



Improve the treatment of MDR-TB

16

Countries

2

Core Projects

1

Regional Project

1496

People Trained



728



768

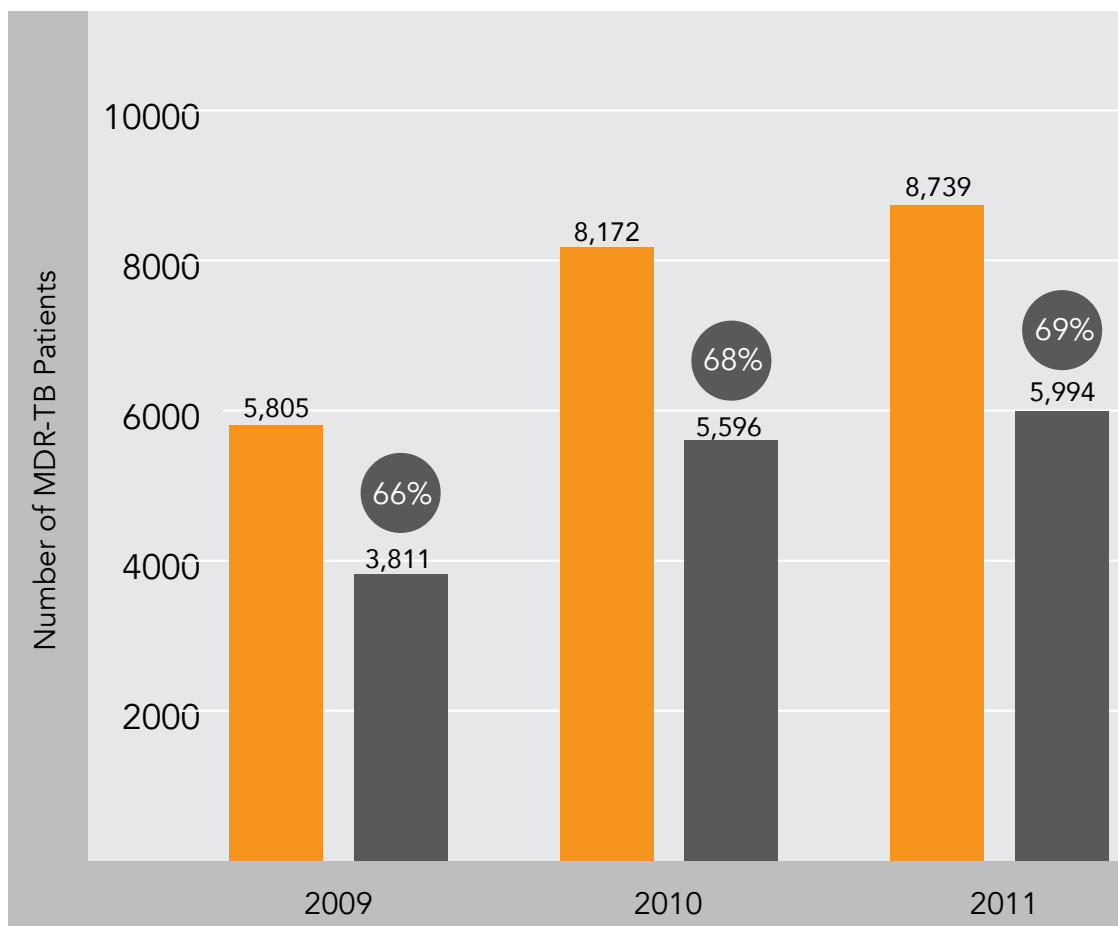
QUALITY DIAGNOSIS AND TREATMENT

As the diagnosis and treatment initiation for MDR-TB are scaled up in most countries, it is essential to also ensure the quality and completion of appropriate treatment. As PMDT programs expand many countries have seen treatment success rates decrease or remain low as the complexities of managing more patients rise. As seen in the figure on page 46, more patients were successfully treated from the 2011 cohort (5,994) than the 2010 cohort (5,596), however the overall number of MDR-TB patients on treatment also grew, resulting in only 69% treatment success (compared to 68% in 2010). Although an improvement over 2009 levels (only 3,811 treated and 66% successfully treated), there is major work still to be done to improve treatment outcomes for MDR-TB patients. Cambodia (86% TSR), Zimbabwe (81%) and Uganda (77%) were the only countries to exceed the target of at least 75% treatment success, although Kazakhstan (74%), Ethiopia (72%) and Viet Nam (72%) are nearing the target (see Annex II for MDR-TB TSR by country).

Innovative and patient-centered approaches need to be adopted and made standard practice to significantly affect the treatment outcomes of MDR-TB patients. In the Akmola Region of Kazakhstan, TB CARE I has been demonstrating how the standard hospital-based treatment approach can be replaced with the use of outpatient care for non-infectious adult and pediatric TB/MDR-TB patients. In Akmola region, the introduction of outpatient care has led to considerable improvements in TSRs. Compared to a 66% TSR (TB and MDR-TB patients combined) reported in 2011, rates improved to 72% in 2012 and to 86% in 2013.

Providing patient-specific and patient-centered support to MDR-TB patients also needs to become more routine practice as there is strong evidence that this improves treatment adherence and treatment outcomes. Building on successes of Year 3, seven countries (Cambodia, Ethiopia, Indonesia, Kyrgyzstan, Namibia, Nigeria and Tajikistan) invested directly in the support of MDR-TB patients during their treatment; support included nutrition, transportation costs, psychological and counseling support, in combination with side-effect management.





Number of MDR-TB patients registered on treatment and number (percent) that successfully completed treatment (WHO 2014)*

*Although TB CARE I started its operations in October 2010, many patients who started MDR-TB treatment in 2009 and 2010 were being managed and supported with TB CARE I support during the course of their two-year journey through treatment. Successful completion of treatment includes 'cured' and 'completed treatment'. Nineteen TB CARE I countries are included in the totals provided (Djibouti and Dominican Republic excluded).

HIGHLIGHTS OF TB CARE I PMDT SUPPORT

- In Indonesia, coverage of PMDT services has significantly improved compared to last year; treatment services are now available in 18 provinces and access to diagnosis has been expanded to 196 districts in 28 provinces. Introduction of Xpert has considerably reduced diagnostic delay for MDR-TB patients: 91% of presumptive cases receive test results within 0-7 days (47% on the same day). Introduction of Xpert has also significantly reduced the initial high mortality of MDR-TB patients caused by the long diagnostic process of conventional C/DST, from 8.3% in (2009-2012) to only 1.5% in Q3 2014.
- In addition to the 17 TB CARE I countries that currently have staff in country, the program has been providing TA to the NTP in Senegal on PMDT. During Year 4, based on in-country site visits and workshops with NTP staff and key stakeholders, a plan for MDR-TB management in Senegal from 2014-2017 was developed and submitted to the Global Fund. In addition, a protocol for a study of a nine-month regimen for MDR-TB was developed for the NTP.
- One of the obstacles to the scale up of PMDT is the poor linkage of PMDT with hospitals and private practitioners. To address this TB CARE I developed the **PPM PMDT Linkage – A Toolkit**. This tool was designed to help establish better links and is a collection of best practices and lessons learnt from the experiences in the participating countries, including inputs for improvement and use of PPM PMDT linkage assessment and planning.



Center of Excellence on PMDT Training

The CoE on PMDT Training, based in Kigali Rwanda, brings together the National TB and Leprosy Program of Rwanda, the National Reference Laboratory and the School of Public Health, National University of Rwanda. The CoE was established to build technical capacity on PMDT in the region using the Rwandan PMDT program as a case study. Partially funded by and receiving technical support from TB CARE I, this center has been a regional success, expanding to other technical areas important to the region (i.e. childhood TB, TB-IC). In Year 4, five international trainings were implemented with TB CARE I support: TB-IC, PMDT, TB/HIV, laboratory strengthening and childhood TB. In total 87 trainees participated from 17 African countries and one Asian country (India). Childhood TB was a new topic for the center this year and a new curriculum and course on the management of childhood TB was developed. At each of these trainings, there has been a combination of participants funded by the CoE and other sources (i.e. NTPs sending their staff from country funding). This demonstrates the CoE's marketability and the trend towards greater self-sufficiency and sustainability.



TB/HIV



Strengthen the prevention of TB/HIV co-infection

Improve the diagnosis and treatment of TB/HIV co-infection

11

Countries

1

Core Project

6

Regional Projects

1055

People Trained



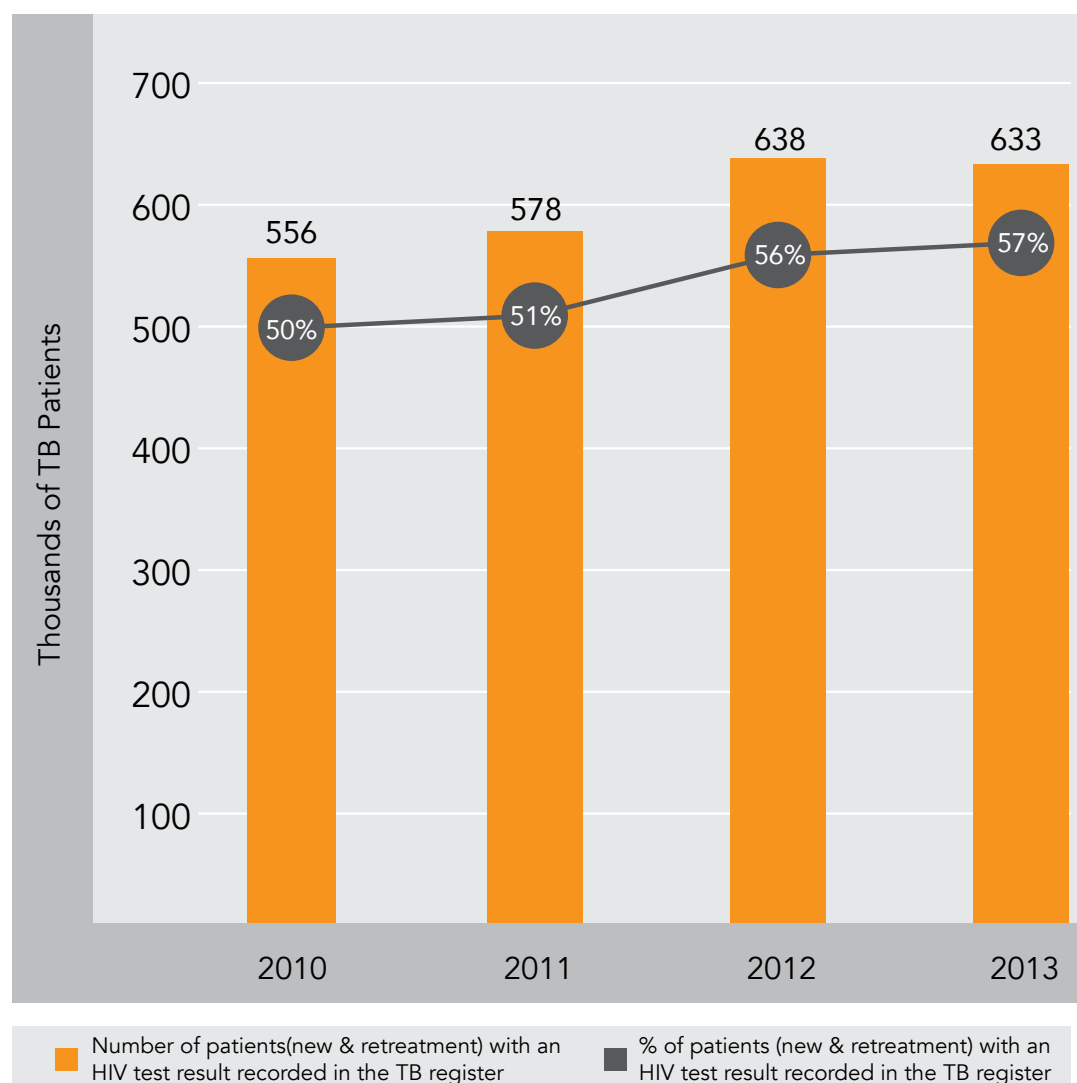
498



557

TESTING FOR HIV

With 57% of TB patients having HIV test results recorded in the TB register in 2013, slow improvements are being made (compared to 50%, 51% and 56% in 2010, 2011 and 2012 respectively). Globally in 2013, 48% of notified TB patients had a documented HIV test result (46% in 2012), which illustrates that TB CARE I countries are generally ahead of the curve. Although TB CARE I countries in Africa and the CAR region are generally doing well with HIV testing, countries such as Indonesia (where HIV testing is limited and TB cases are high) affect the overall progress. One of the TB CARE I countries with the greatest improvements in HIV testing is Nigeria, where TB CARE I has made substantial investments in TB/HIV services; national increases in HIV testing among TB patients have been measured at 79% in 2010, 84% in 2012 and 88% in 2013. During Year 4 in the 35 states supported by TB CARE I for TB/HIV services, 93% of TB patients had HIV test results recorded in the TB register.

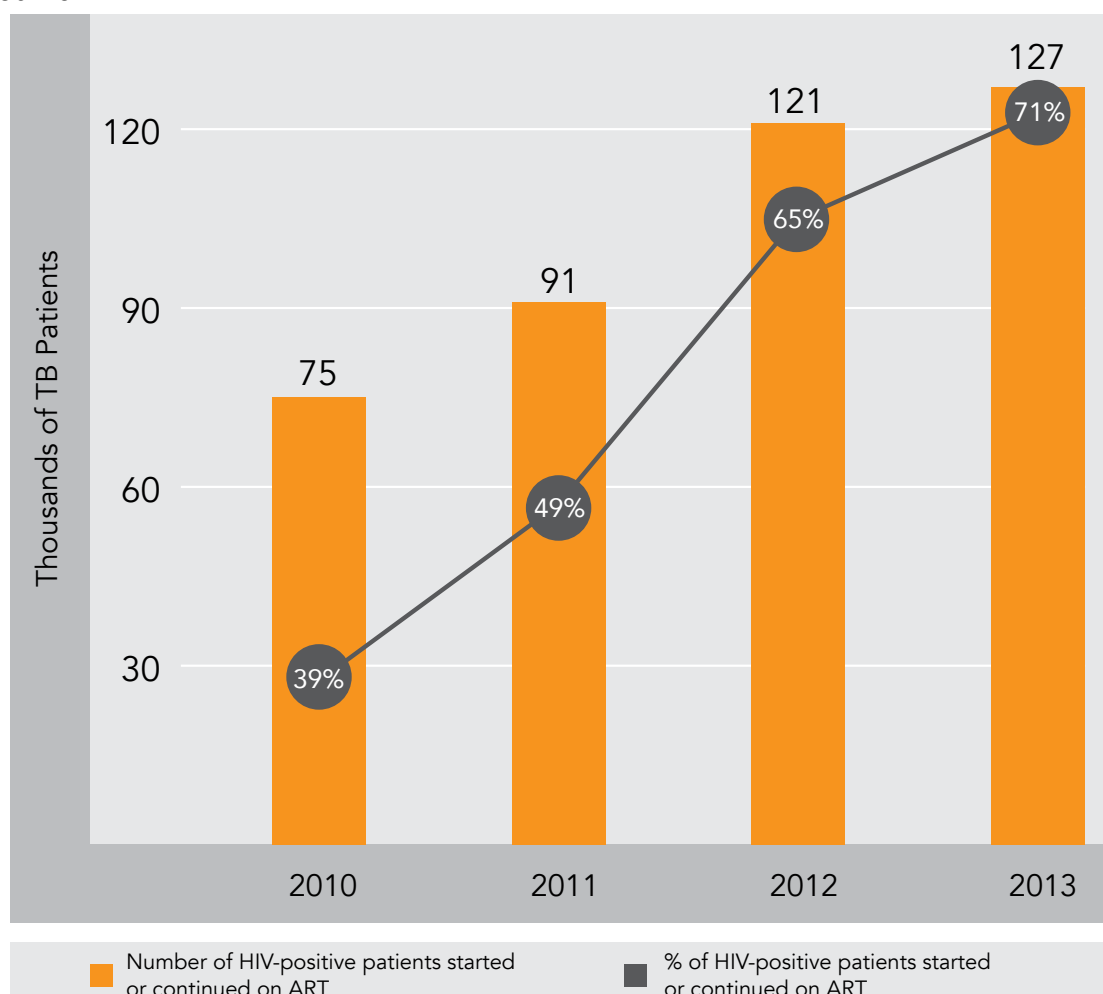


*n=21 (2010-2012), n=19 (2013)

ANTIRETROVIRAL THERAPY AND COTRIMOXAZOLE PREVENTIVE THERAPY

TB CARE I has worked in ten countries in Year 4 to expand antiretroviral therapy (ART) and/or cotrimoxazole preventive therapy (CPT) coverage among co-infected patients (Botswana, Ethiopia, Ghana, Indonesia, Mozambique, Namibia, Nigeria, South Sudan, Zambia and Zimbabwe). The average percentage of HIV positive TB patients on ART in 2013 rose to 71%, up from 39% in 2010, 49% in 2011 and 65% in 2012 (see below). The global average also rose from 57% to 70% in 2013. Further decentralization of ART services will be necessary to achieve the 100% target set for 2015. Improvements of more than 10% from 2012 to 2013 were seen in Mozambique, Nigeria, Tajikistan, Uzbekistan and Viet Nam.

Number and Percentage of HIV-positive TB patients started or continued on ART in TB CARE I countries* (WHO 2014)



CPT coverage among HIV-infected TB patients has fluctuated since the beginning of TB CARE I (85% in 2010, 87% in 2011, 90% in 2012 and 85% in 2013). Although a decrease in coverage seems to have occurred in 2013 based on data reported to WHO, some data may be missing (i.e. Ethiopia), which could be bringing down the overall results. In Indonesia (only 30% reported CPT coverage in 2013), CPT coverage is expected to increase dramatically with the MoH's newly introduced 'test and treat initiative', which mandates all co-infected patients to receive ART and CPT. In Zimbabwe where TB CARE I has been implementing a TB/HIV integrated care approach in 23 sites, CPT coverage has been well above the national average (96% compared to 77%).

*n=21 (2010-2012), n=19 (2013)

Spotlight: TB/HIV coverage improving in Zimbabwe

The national target in Zimbabwe is to test all registered TB patients for HIV and commence all HIV positive TB patients on both CPT and ART. At the 23 Integrated TB/HIV Care (ITHC) sites that TB CARE I helped establish, there has been a progressive improvement of TB/HIV care with time due to on-going mentorship, supportive supervision and training activities. At the 23 ITHC sites, patients with recorded HIV test results remained at 97% in Quarter 2 and 3 of Year 4. ART uptake increased from 72% to 79% from Quarter 2 to Quarter 3. A total of 47,615 HIV positive patients were screened for TB in HIV care settings at the ITHC sites compared to 43,739 during the previous quarter. Among those screened eight (0.02%) were diagnosed with TB and initiated on treatment.



SCREENING FOR TB AND TREATMENT FOR LATENT TB INFECTION

Screening for TB and treatment of LTBI among HIV positive clients continues to be a challenge as does the reporting of these cases. In 2013, of the 17 TB CARE I countries, 71% (12/17) reported to WHO on screening for TB of people enrolled in HIV care compared to 47% (9/19) for 2012. Similarly, 65% (11/17) of TB CARE I countries reported on the treatment of LTBI in 2013 compared to 58% (11/19) in 2012. Only 21% of countries globally and 34% (14/41) of the high TB/HIV burden countries reported provision of IPT to PLHIV. Often this is because the reporting system does not capture these data or because providing IPT for PLHIV is not yet implemented by the NTP/NAP.

TB CARE I provided substantial support for the provision of IPT in three countries: Ethiopia, Indonesia and Mozambique. However, the reported number of PLHIV started on IPT in Ethiopia halved compared to 2012 (from 30,395 to 15,424), potentially a result of delayed/incomplete reporting, while in Mozambique the reported number almost tripled (from 17,317 to 48,188).

Although Indonesia did not report 2013 data on IPT to WHO, IPT has been included in the national policy after successful pilot implementation in four hospitals in Year 3. The National TB/HIV Forum now supports IPT scale up in eight provinces with TB CARE I's TA. In Quarter 3, 94% of PLHIV were screened for TB compared to the Year 4 target of 85% and IPT provision was introduced in seven provinces and implemented in 29 hospitals.

THE THREE 'I'S INITIATIVE – STRENGTHENING TB/HIV COLLABORATION

Zambia and Namibia both began implementing the joint USAID/Centers for Disease Control Three I's Initiative (3 I's) in 2013. The project is a three-year initiative funded by the US Office of the Global AIDS Coordinator (OGAC) to demonstrate how improved resources could strengthen TB/HIV collaboration as well as expand service delivery in the areas of intensified case finding (ICF) for TB among PLHIV, IC and IPT. In Namibia, the project works in four districts; in Year 4 achievements included conducting TB-IC assessments and developing TB-IC plans in all participating districts, conducting targeted household visits for IC assessments and screening of household members for TB, as well as screening all PLHIV for TB and referring eligible patients for IPT or TB investigation as per national guidelines.

In Zambia, the 3 I's project is implemented in four provinces. In Year 4, sputum collection points were established at the supported health facilities. Community volunteers collect sputum from presumptive TB patients identified at the registration desk or outpatient departments of the participating health facilities. In just two 3 I's provinces, the project successfully supported the testing of 10,898 individuals for TB using the seven 3 I's-supported Xpert machines (six other Xpert machines were implemented in two additional provinces). Active TB disease was diagnosed in 1,323 (12%) and RR-TB in 49 (4%) out of the diagnosed cases. As these projects are ongoing, the final project results will be included in the TB CARE I Final Report and the country-specific end-of-project reports, all of which will be available in 2015.



Spotlight: Strengthening Xpert use for increasing TB case detection among PLHIV in Nigeria and Zimbabwe

TB CARE I is piloting a practical model for increasing access of PLHIV to Xpert testing as a part of routine health care services in Zimbabwe and Nigeria. The model aims to

- Increase the number of PLHIV tested for TB with Xpert and put on TB treatment
- Strengthen the accessibility and quality of Xpert testing service
- Strengthen the collaboration between TB and HIV services
- Inform policy and practices

The model was designed to be implemented within existing TB and HIV services, targeting priority geographic areas in each country. The approach consists of active case finding using national HIV/TB screening protocols based on WHO recommendations, increasing awareness of Xpert utilization through integrated training for all HCWs, introducing rapid TB diagnosis for PLHIV with presumed TB, implementing new guidelines to strengthen supervision and monitoring activities, improving access to Xpert testing through a reliable specimen referral (transportation) system, simplifying care and treatment of PLHIV with TB through a "one-stop-shop" strategy for ART management at TB clinics, and regular TB/HIV meetings in facilities.

Prior to implementation, screening of PLHIV for TB was not done consistently. In addition, the selected sites primarily used Xpert (if available at all) for MDR-TB presumptive cases with limited or no access for PLHIV to Xpert testing. Simply by initiating the project and drawing more attention to screening practices, pilot activities appear to have strengthened TB screening among PLHIV registered in care.

Preliminary results reveal dramatic increases of 50-70% in the specimen referrals of PLHIV for Xpert testing at the different pilot sites. This is mainly attributed to optimal use of existing and newly established specimen transportation systems, which are minimizing the number of PLHIV with presumptive TB lost to follow-up. With this increasing rate of referral, more PLHIV are being tested for TB. In Zimbabwe (two sites), 294 TB cases among PLHIV (including 18 RR-TB cases) have been detected since May 2014 as a result of the new approach (17% TB positivity rate). Across Nigeria's three sites, 202 TB cases among PLHIV were detected (13% TB positivity rate) of which 31 were RR-TB. At present, the major impact observed is a more rapid system for case detection due to effective screening practices, consistent and sustainable specimen referral, strengthened integration of TB/HIV services and rapid Xpert testing. This alone is promising for patient care and the reduction of TB transmission within the community.





HEALTH SYSTEMS STRENGTHENING

{ TB control is embedded as a priority within national health strategies and plans, with matching domestic financing and supported by the engagement of partners

{ TB control components (e.g. drug supply and management, laboratories, community care and M&E) form an integral part



16 Countries

13 Regional Projects

979 People Trained



479



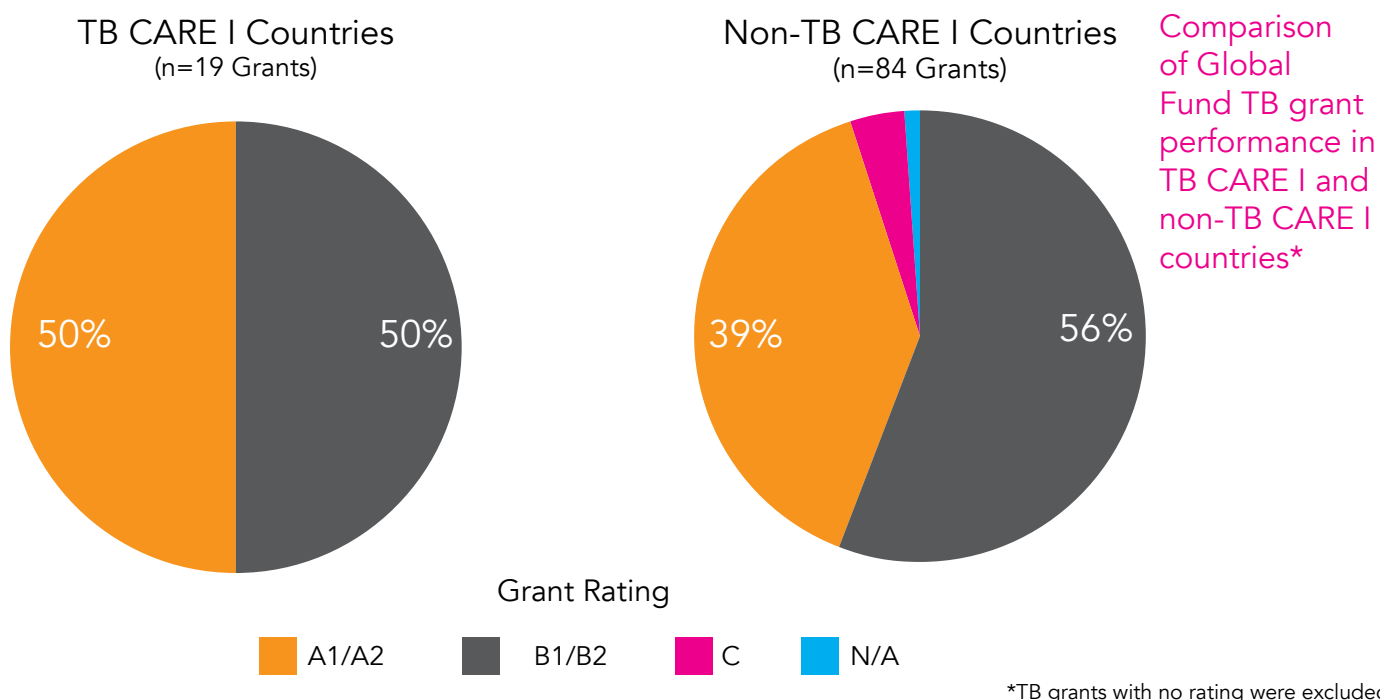
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TB CARE I AND THE GLOBAL FUND

TB CARE I plays a key role in collaborating with and supporting the Global Fund (GF) globally and at country level. Year 4 has been an especially critical time in supporting countries to prepare for and submit GF concept notes; all project countries, with the exception of Kyrgyzstan and Tajikistan, received some form of technical support from TB CARE I. Six countries (35%) were supported by TB CARE I to conduct analyses of the epidemiological situation in the country (Afghanistan, Botswana, Indonesia, Nigeria, South Sudan and Zambia) and 13 projects (77%) supported national strategic plan development (Afghanistan, Botswana, Cambodia, Ethiopia, Ghana, Indonesia, Kazakhstan, Mozambique, Nigeria, South Sudan, Viet Nam, Zambia and Zimbabwe). Building on this intensive support, TB CARE I has also been helping with GF concept note development in the 13 countries mentioned above as well as Namibia (14 total; 82%). In Nigeria TB CARE I extensively supported the development of a national epidemiological assessment, the national strategic plan and the GF concept note, which was submitted in August 2014.

Not only is TB CARE I helping countries prepare for future GF grants, but the program is also helping to support and manage current GF grants. As seen from the figure on page 56, GF TB grant performance is stronger in TB CARE I countries compared to non-TB CARE I countries. While 50% of all grants in TB CARE I countries are rated as A1/A2, only 39% of grants in non-TB CARE I countries have the same rating. In Indonesia, major financial, managerial and technical support has been provided to the MoH, the principal recipient of an ongoing GF grant. On the request of the GF, KNCV was appointed a sub-recipient on the MoH grant to manage and advise on all GF-related TA. In collaboration with partners, KNCV developed a TA plan, which began implementation in October 2014.





TRAINING AND SUPERVISION

TB CARE I continues to invest in human resource capacity building through training, supportive supervision and on-the-job training. In Year 4, targets for numbers trained were surpassed; 15,772 people were trained in TB CARE I countries (including 232 from core funds and 106 from Regional funds) compared to the planned 14,458 in country project workplans (107% completion). Although the numbers are slightly lower than Year 3 totals (16,730), TB CARE I prioritizes quality of training over sheer numbers. Females made up 44% of all trainees this year, an increase from 39% last year. Gender differences varied greatly by country with Afghanistan (11% female) and South Sudan (23%) having the lowest percentage of female trainees while Kyrgyzstan (81%), Kazakhstan (75%) and Namibia (70%) had more female trainees. The figure on page 57 summarizes the distribution of trainees by technical area in Year 4, which follows similar trends to Year 3.



Also in Year 4, TB CARE I supported the NTPs in all TB CARE I countries with supervision activities. In total, 6,723 supervision visits were conducted with TB CARE I support – a 168% increase over the 2,509 visits conducted last year and 22% more visits conducted than planned for Year 4. Supervisory visits in Nigeria made up 77% of all the completed visits this year.

COSTING

Countries need to develop sustainable financing strategies which replace dependency on donor funding with increased government budget allocations and revenue from insurance and corporate social responsibility financing. A key related strategy is to improve cost-effectiveness and efficiency so that results can be maximized with limited resources. To assist with this, TB CARE I has developed a suite of four costing tools that donors and governments can use to model costs and analyze cost-effectiveness. All the tools are open source, based in Microsoft Excel and are intended for NTP planners and managers. Blank and example versions are available as well as examples of country reports. The tools were developed and tested in individual countries but can be used by any country. The tools (see **page 74** for more detailed descriptions and links to each tool) are:

- TB Services Costing Tool
- MDR-TB Cost Effectiveness Analysis Tool
- TB Economic Burden Analysis Tool
- Tool to Estimate Patients' Costs

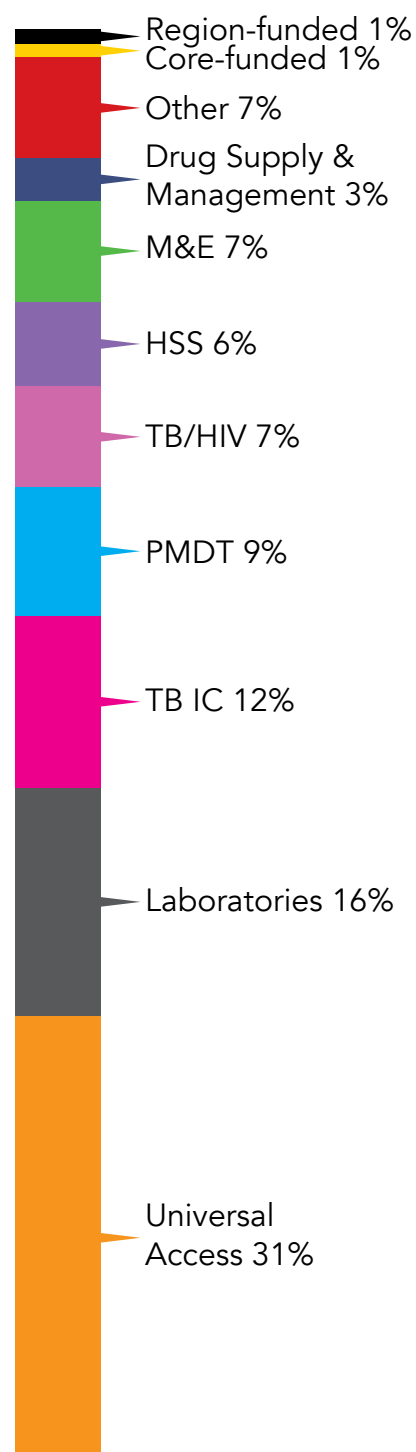
In Indonesia, use of the TB Services Costing Tool indicates that the approximate cost of the resources needed for the country to reach its targets of treating 364,963 TB cases and 1,692 MDR-TB cases in 2014 would be US\$100 million and this figure would rise to US\$118 million (excluding inflation) in 2016 as the targets increase. Based on the above figures, the average cost per TB case treated in 2014, including indirect facility running costs, would be US\$228 and the average cost for an MDR-TB patient who starts treatment in 2014 would be US\$10,027. The average cost per capita would be 41 US cents, which can be compared with the economic burden of TB in Indonesia, which is around US\$8 per capita, indicating that investment in TB detection and treatment is worthwhile.



TB CARE I Costing Tools

The estimation and projection of costs are essential for the planning, budgeting, financing and evaluation of TB services. To meet this need TB CARE I has developed four costing tools which are presented in this four page document.

Distribution of individuals trained per technical area (country projects only) and funding source (Regional and core-funded) (n=15,744)



In Ethiopia, use of the *Tool to Estimate Patients' Costs* showed that on average each patient spent more than US\$233 on diagnosis, treatment, travel and food. Most of the patients lost their jobs and, on average, patients lost 40% of their income. To cover the diagnosis and treatment costs, 38% of the patients sold property (mostly livestock), 14% leased out property (mostly land) and 41% took out loans. In both cases this reduced their household financial reserves and their current and future income. Forty-seven percent of the patients received some assistance from donors, but the amounts involved were generally much smaller than the costs. The cost to families was overwhelmingly catastrophic and if they were not already poor before catching MDR-TB they certainly were afterwards.



A group of people, including men and women, are seated around a wooden table, focused on reviewing documents and papers. One man in a striped shirt is writing in a notebook. A red binder with the text 'NATIONAL TB CONTROL CENTER' is visible on the table. The background shows a simple room with a chalkboard.

MONITORING & EVALUATION, SURVEILLANCE AND OPERATIONS RESEARCH

Strengthen TB Surveillance

Improve the capacity of NTPs to analyze and use quality data for the management of the TB program

Improve the capacity of NTPs to perform operations research

16 Countries

1 Core Project

1156 People Trained



768



388

ELECTRONIC RECORDING AND REPORTING

Electronic recording and reporting (ERR) is established in ten TB CARE I countries (Botswana, Cambodia, Indonesia, Kazakhstan, Kyrgyzstan (not fully functional), Namibia, Nigeria, Tajikistan, Uzbekistan and Viet Nam). Of these countries, TB CARE I has provided moderate to substantial support for ERR in Botswana, Cambodia, Indonesia, Nigeria and Viet Nam. At the end of Year 4, the e-TB manager system in Cambodia was officially handed over to the NTP. The country-specific ERR system is fully aligned with the new WHO case definitions, contains information on all DR-TB patients enrolled since 2011, and has a functioning medicine management module for second line TB drugs that is used at all treatment sites that receive drugs from the NTP. In Viet Nam, TB CARE I has supported the Viet Nam TB Information Management Electronic System for Drug-sensitive TB (VITIMES), as well as e-TB manager, the electronic system for DR-TB. TB CARE I has also supported the development and maintenance of VITIMES, as well as the development of a data management manual. e-TB manager is being used in all MDR-TB treatment sites nationwide and is expected to be fully handed over to the NTP by the end of TB CARE I.

The program has provided support in Ethiopia, Mozambique and Zimbabwe to lay the groundwork for electronic systems. In Mozambique, a draft electronic TB register was presented to NTP provincial supervisors during a workshop organized by the NTP/ TB CARE I. Piloting of the register will be done by the NTP in the last quarter of 2014 with plans for implementation in 2015. In Zimbabwe, TB CARE I led the customization of an electronic TB register. Based on an operational plan that was developed at the beginning of Year 4, ERR software was developed with five modules: presumptive register, health facility TB register, MDR-TB register, laboratory register and a reporting module that is able to generate quarterly reports. The Electronic Recording and Reporting system (ERR) will be piloted in six provinces by the NTP after the lifespan of TB CARE I.



DATA QUALITY AND USE

Throughout the life of the program, TB CARE I has put great emphasis on the importance of data quality and the use of data for decision-making. At country level in Year 4, TB CARE I has worked in 14 (82%) of project countries to improve the quality of data at various levels of the system. The measurement of data quality has consistently gained greater traction with 88% of active TB CARE I countries now measuring data quality on a regular basis, compared to 50% of countries at baseline.

TB CARE I has also been investing in data quality and use at the global level. In Year 4, the handbook ***Understanding and Using TB Data*** was released. The document shows how to use various data sources, presents existing tools to analyze the quality of data and describes methods to estimate the burden of TB and related trends. It is aimed at NTP managers, M&E officers, researchers including epidemiologists and statisticians, and staff working with technical, financial and development agencies.

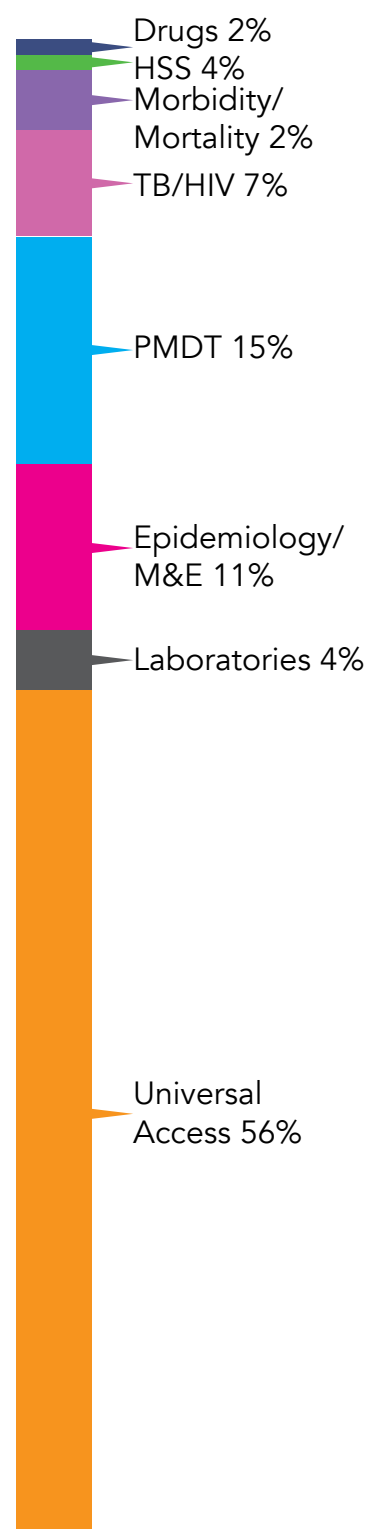
Innovations in ***TB Data Quality - An M&E Workshop Facilitators Guide*** was also released this year. Developed for the multi-year core project to help strengthen M&E efforts in 16 countries, this workshop material was designed to build the capacity of M&E Officers from NTPs and TB CARE I country teams. The focus of the course was on avoiding, detecting and fixing data quality problems.



OPERATIONS RESEARCH

During the four years of TB CARE I, operations research studies have been conducted in 18 countries. In total, 114 studies have been initiated, with TB CARE I's level of involvement varying from major or minor financial/technical support to full implementation of the studies. Although 26 initiated studies were cancelled at some stage of implementation (23%), 54 studies were completed as of September 2014 (61% of the remaining studies). Thirty-three studies are expected to be completed by December 2014. The figure on the right presents the completed studies by technical area. More than half of the completed studies fall under Universal Access (56%), followed by PMDT (15%) and Epidemiology/M&E (11%).

Completed OR studies by technical area



RESULTS AND DISSEMINATION INFORMATION FOR OPERATIONS RESEARCH STUDIES COMPLETED DURING YEAR 4

Country	Title	Study Results	Means of Dissemination
Cambodia	A randomized control trial to improve the referral of risk groups for TB through private providers and community DOTs watchers	See page 24 in the Universal Access section for a summary of the study results.	Presentation of the abstract at The Union Conference on Lung Health and Tuberculosis in Barcelona, Spain
Ethiopia	Factors associated with case notification of smear positive TB in the SBBPR region	Assignment of a full time health care provider in the TB clinic, above median knowledge score of HCWs and availability of recording tools in health centers were independent predictors of high case notification rates for bacteriologically confirmed TB patients.	2014 TB Research Advisory Committee (TRAC) conference & to be published
Ethiopia	TB treatment outcome under centralized and decentralized care among smear positive pulmonary TB cases, in Oromia region, Ethiopia	Proportion cured was similar among patients followed under centralized and decentralized (i.e. community) care models. However, the proportion that completed treatment was higher at the community level, with fewer patients that died and defaulted.	2014 TRAC conference & to be published
Ethiopia	Implementation of TB screening in public health centers in Amhara Region, Northern Ethiopia	The study found that 72% of health centers had good TB screening practices (i.e. >80% of attending patients at the outpatient department). Of those screened, 1.6% were diagnosed with TB; having a multidisciplinary team and support from partners improved screening practices.	2014 TRAC conference & to be published
Ethiopia	Operational challenges in the management of MDR-TB patients at treatment follow-up health centers in Addis Ababa, Ethiopia	Sixty-one percent of MDR-TB patients (135/221) had a documented HIV test result, of which 17% were HIV infected. Of the 221 MDR-TB patients, 60% (132) were currently on MDR-TB treatment, but 17% (38) had no information recorded on treatment outcomes.	2014 TRAC conference & to be published
Ethiopia	Treatment outcomes of smear negative and extra pulmonary (EP) TB cases compared to smear positive cases in Addis Ababa	EPTB cases were over-represented in private Health Facilities (HFs) and smear negative PTB was reported more frequently from health clinics rather than hospitals. No difference was observed in treatment outcome between private and public HFs. The most common missing information was patient & contact addresses and unfavorable outcomes correlated with missing information and old age.	2014 TRAC conference & to be published
Ghana	Assess the impact of Xpert in improving TB case detection among PLHIVs at Atua Government Hospital	Between March-September 2013 a total of 505 clients were tested using Xpert technology; 90 (18%) had MTB detected results and 18 (20%) were rifampicin resistant. HIV status of clients tested with Xpert was unknown as there was no systematic link between the lab and the HIV clinic.	Preliminary results disseminated to the hospitals and at NTP mid-year review meeting
Indonesia	Involvement of village midwives in case finding of people with TB in Siak District, Riau Province	The average level of midwife TB knowledge after training was higher than before training. Midwives in the intervention group were more specific in referring presumptive TB patients to health centers. The proportion of sputum examined were higher (1.83) in the intervention area than the control group, however within the intervention group referrals were 2.49 times more likely to be smear positive than control area referrals.	Report to NTP and Tuberculosis Operational Research Group (TORG)

Country	Title	Study Results	Means of Dissemination
Indonesia	Increasing TB patient involvement for suspect finding in Kubu Raya District, West Kalimantan Province	The intervention group engaged ex-TB patients in identifying and referring presumptive TB patients to community health centers. The study showed an increase in the overall number of referrals in the intervention group compared to the control group (1.9 times more referrals in the intervention group).	Report to NTP and TORG
Indonesia	Increasing the role of nurses in TB suspect finding in Kota Palu, Sulawesi Tengah	Engaging family public health nurses in the identification and referral of presumptive TB cases increased referrals by 4.1 times compared to control areas. Referrals in intervention areas were 1.35 times more likely to have sputum examined compared to control areas. To maximize nurse involvement techniques to increase and maintain their motivation may need to be explored.	Report to NTP and TORG
Indonesia	Role of comprehensive counselling (including education) to increase TB patient understanding and patient retention in Maluku Utara Province	Educational and comprehensive services provided to TB patients by HCWs decreased loss to follow-up by 9% within the intervention group. After adjusting for permanent residency status, knowledge and patient age, loss to follow-up decreased by 11% within the intervention group.	Report to NTP and TORG
Indonesia	Impact of operations research on local TB program policy and practice in Indonesia	Although the impact of OR studies varies greatly, overall the majority of the ORs contributed to existing policy and/or became the basis of new policy and practices in the TB program. Still needed: 1. Close monitoring of the implementation of OR recommendations 2. Network among OR researchers 3. Careful selection of research topics – the topic should result in recommendations that are new to the policy makers, and should fill an identified gap 4. More emphasis on appropriate (and broader) dissemination, also internationally if the results warrant it	Report to NTP, TORG and scientific manuscript
Nigeria	Low TB case detection rate in Nigeria: Are the community volunteers performing optimally?	Community volunteer (CV) approaches for TB control (four models assessed) were not standardized. Preliminary results showed that TB referrals were very low in three out of four models. The median annual presumptive TB referral per CV from the comprehensive target-oriented model was highest 48 (IQR 42.8, 58.8) compared with 3 (IQR 0, 7.5), 12 (IQR 7.5, 18.5) and 1 (IQR 0.0, 3.5) from the direct dealing, supervision without target and laissez faire models respectively ($H = 70.850$, $p < 0.001$). Knowledge of TB symptoms, hours spent on TB referral, regular provision of compensation, involvement in treatment support, tracing patients lost to follow up, and explicit referral targets were positively associated with active referral of presumptive TB and TB case finding.	Stakeholders meeting and publication in a journal
Nigeria	Assessment of effectiveness of an intervention to increase TB screening and referral behavior of local Quranic school pupils in Kano, North-Western Nigeria	Out of 40 referrals in the control group, only 12 (30%) were noted as presumptive TB patients (based on screening results). Within the intervention group, 50% of referrals (136/274) were noted as presumptive TB patients. Mean referral of presumptive TB patients was statistically significantly higher among the intervention group compared to the control group. Mean referrals were also significantly higher in the control group after training was conducted for this group.	Stakeholders meeting, e-poster at Barcelona Union conference and publication in a journal

Country	Title	Study Results	Means of Dissemination
Tajikistan	Risk factors associated with loss to follow-up from TB treatment in four regions of Tajikistan	In the study regions, 356 TB patients were reported as lost to follow-up (LTFU) in 2011 and 2012; 89% (317) were actually followed up, identified and matched with 628 controls (successfully treated patients). The majority of the LTFU cohort were male, 19-40 years old, living in rural areas and smear positive at baseline. The number of MDR-TB patients lost to follow-up (n =19) were too small to be separately analyzed. The univariate analysis showed an association with higher risk for LTFU with migration to another country (Odds Ratio (OR) 9.03, 95% Confidence Interval (CI) 6.18-13.2), migration in country (OR 9.02, 95% CI 3.9-20.8), having side effects (OR 2.42, 95% CI 1.48 – 3.96), drug abuse (OR 4.34, 95% CI 1.08 – 17.5), various retreatment categories (OR 2.0-2.6), and being male (OR 1.8, 95% CI 1.37-2.42). Factors protective of LTFU were having EPTB (OR 0.51, 95% CI 0.36 – 0.73), all age groups when compared to the most prevalent age group of 19-40, and still studying (OR 0.43, 95% CI 0.22 – 0.84). The multivariate analysis showed that migration out of country, moving within country, side effects and being a retreatment case were the only significant factors.	Report and dissemination workshop
Viet Nam	Assessment of palliative care for MDR-TB patients in Viet Nam	The entire package of palliative care is not yet incorporated in the management of patients with MDR-TB. Though physicians at the level of the commune may be able to identify adverse drug reactions (ADRs), ancillary drugs to relieve these ADRs were not available. Currently, there is no protocol or further care plan for patients who failed DR-TB treatment. Advice from hospital staff is limited to reminding the patient to wear surgical masks and taking TB-IC precautions—cough etiquette, opening of windows at home. Codeine and morphine are available in Viet Nam, but not used for TB patients with uncontrollable cough.	Report to NTP



Spotlight: Ethiopian Initiative to Build Capacity for Sustainable Operations Research

Ethiopia has a strong history of conducting operations research, but translating research results into policy or practice has been limited. In 2012, to meet this challenge the USAID Mission in Ethiopia with the Federal Ministry of Health (FMOH)'s TRAC and key national and international partners including TB CARE I developed a project proposal to build sustainable OR capacity in Ethiopia. The initiative consists of three key pillars: building new capacity, enhancing existing capacity, and structuring and translating results into action for TB control. Using a 'learning by doing' approach, TB CARE I together with TRAC conducted intensive modular training for regional OR teams consisting of TB and TB/HIV program staff together with academia who as a team conducted an OR project in line with national priorities. OR teams were mentored throughout the process by experienced Ethiopian researchers from regional universities who were backstopped by international facilitators operating under TB CARE I. Since 2012, 52 people were trained in two cohorts on OR who in teams conducted 13 different OR projects. Results from six studies have been published to date (Public Health Action special issue, in press). In addition to building new capacity, existing capacity was enhanced by the implementation of a competitive grant

scheme for funding operations research of current researchers through which an additional seven projects were supported. One additional OR project was funded as a result of an advanced training on the impact assessment framework conducted with the London School of Tropical Medicine; this brought the total number of OR projects conducted under the Ethiopia OR initiative to 21.

To strengthen institutional support to conduct OR in the country, the regional ethical review committees (RECs) in all regions were reviewed using structured assessment tools to plan for enhancement of regional capacity. Refresher training for REC teams in the five regions with an existing REC was conducted following the Pan-African Bioethics Initiative. In six regions a new team was trained to form a REC at the regional health bureau.

To disseminate results and share experiences, a TB CARE I-sponsored symposium was held at the Union conference in Barcelona, Spain, highlighting this OR initiative and providing new Ethiopian researchers the opportunity to present their results from the supported studies. A special issue of Public Health Action summarizing the Ethiopian OR initiative and publishing the results from six studies is expected to be released at the end of 2014.



PREVALENCE AND DRUG RESISTANCE SURVEYS

TB CARE I has supported the implementation of TB prevalence surveys in three countries this year: Ghana, Indonesia and Zambia. TB CARE I played a key role in the general implementation and data management of the prevalence survey in Zambia. Survey results are expected to be released in December 2014.

In Ghana, where TB CARE I supported survey data management, the prevalence survey has been completed with the results being launched officially by the end of the calendar year. The interim results indicate that the prevalence of TB in Ghana is 327/100,000 (95% confidence interval: 285-376) as opposed to the former WHO estimate of 71/100,000 (30-129).

In Indonesia, field work for the survey was completed in August 2014. TB CARE I has played a major role throughout survey implementation supporting survey method and tool development, procuring key equipment and supplies, preparing laboratories for survey duties, providing TA on data collection and management, as well as conducting field and laboratory supervision. Final data analysis was conducted at the end of September including the re-estimation of the TB burden in Indonesia, which is essential for NSP and joint concept note development. Final results are expected to be released shortly.

Drug resistance surveys were also conducted and supported by TB CARE I in six countries: Ethiopia, Indonesia, Namibia, Viet Nam, Zambia and Zimbabwe. In Namibia, TB CARE I is supporting the second TB drug resistance survey. The TB CARE I PMDT Clinical Coordinator is overseeing the overall survey and TB CARE I Technical Advisors are part of the technical working group. The survey began in July 2014 and will run until early 2015.





DRUG SUPPLY & MANAGEMENT



Ensure nationwide system for a sustainable supply of drugs

6

Countries

1

Regional Project

445

People Trained



200



245

Drug supply and management has the smallest level of investment of all eight technical areas under TB CARE I. Six countries (Ethiopia, Indonesia, Mozambique, Nigeria, Viet Nam and Zambia) conducted drug management activities in Year 4. Maintaining the successes of Year 3, national forecasts for first and second line drugs for 2015 have been conducted in all TB CARE I countries. In addition, nearly all TB CARE I countries (13/17) also have SOPs for selection, quantification, procurement, and management of TB medicines, with the exception of Botswana, Cambodia, Namibia and Tajikistan.

NEW TB DRUG INTRODUCTION

A fundamental aspect of the rational introduction of new TB drugs in countries is to ensure that national authorities establish the necessary conditions for optimal and responsible use of new TB drugs/regimens. These conditions include: development/update of national guidelines, inventory of minimal infrastructure and resources required (clinical, laboratory, recording & reporting, monitoring and evaluation, drug supply etc.) for proper case-management, efficient pharmacovigilance, and surveillance of drug resistance. In Year 4, TB CARE I developed a protocol for the rational and safe introduction of Bedaquiline, a new TB drug for MDR-TB treatment, and supported Indonesia and Kazakhstan to develop country-specific versions of the protocol. Viet Nam will be preparing a country-specific protocol in November. Participating countries are now implementing their plans (in Indonesia with GF support) to collect information on safety (through active pharmacovigilance), as well as the feasibility and effectiveness of implementation. In addition, following the Expert Group meeting on Delamanid in April 2014, interim guidance on the use of Delamanid in the treatment of MDR-TB has been developed, peer-reviewed and was approved by the WHO Guideline Review Committee in September 2014.

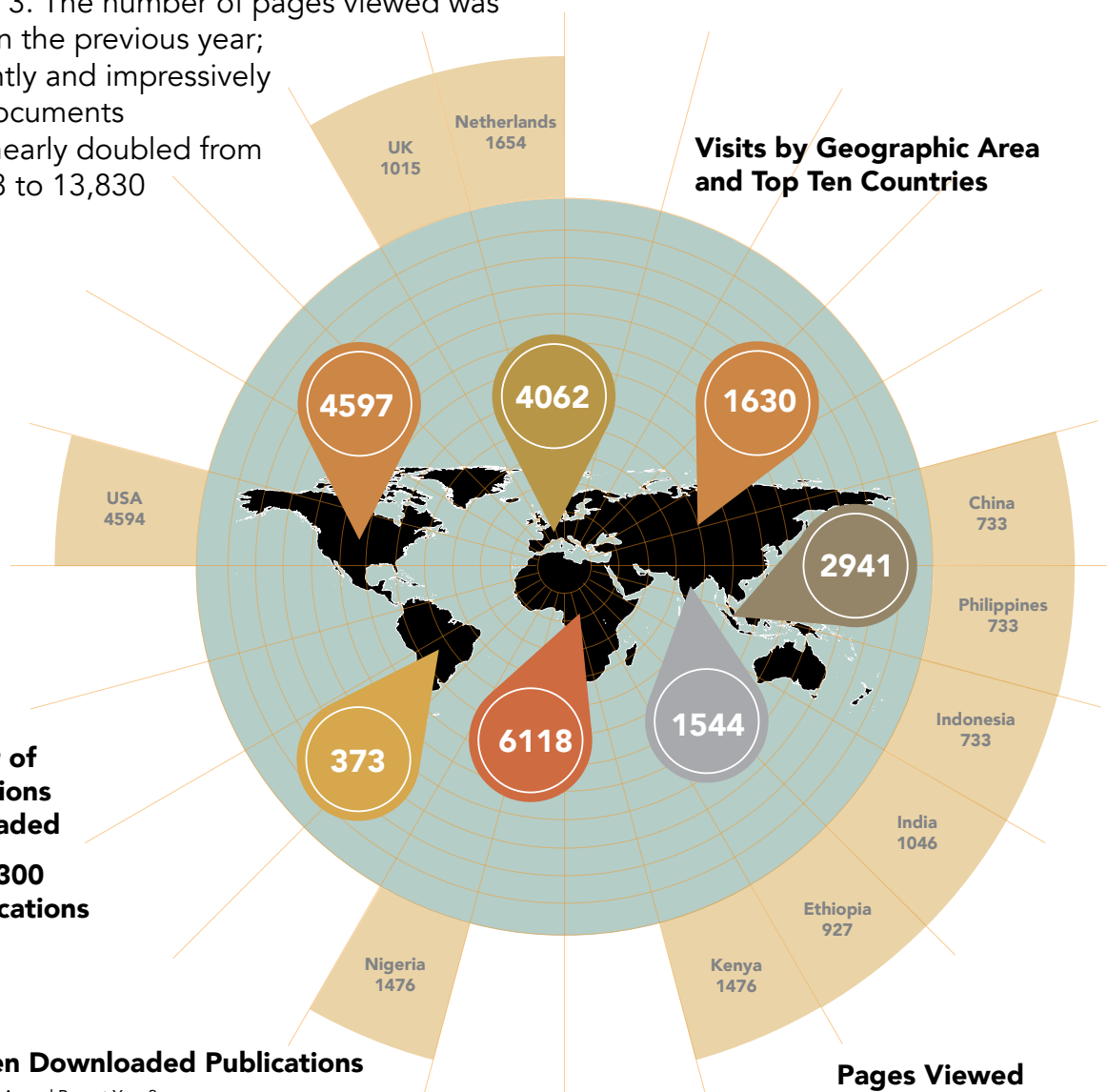


TB CARE I AND KNOWLEDGE EXCHANGE


The TB CARE I website (www.tbcare1.org) has shown a continued rise in interest over the past year with visits up by 17% over Year 3. The number of pages viewed was 15% more than the previous year; most importantly and impressively the number documents downloaded nearly doubled from 6,973 in Year 3 to 13,830 this year.



Visits by Geographic Area and Top Ten Countries



Number of Publications Downloaded

 = 300 publications

Top Ten Downloaded Publications

TB CARE I Annual Report Year 3



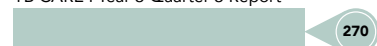
TB CARE I Complete List of Publications



International Standards for TB Care Third Edition



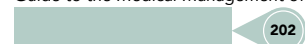
TB CARE I Year 3 Quarter 3 Report



Compendium of Tools & Strategies



Guide to the Medical Management of MDR-TB



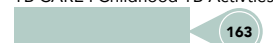
The Roadmap to Successful GeneXpert Implementation



TB CARE I Year 4 Quarter 2 Report



TB CARE I Childhood TB Activities



TB CARE I GeneXpert Core Project Final Report



Pages Viewed



Number of Visitors



NEW TB CARE I PUBLICATIONS IN YEAR 4

TB CARE I strives to make its policy documents and tools available to as wide an audience as possible. Below is a list of tools or publications that have been developed and released in Year 4, all of which can be found on the **TB CARE I website**.

PROGRAM REPORTING

TB CARE I Year 3 Annual Report

The third annual report of the TB CARE I program covering October 2012 to September 2013

TB CARE I Year 4 Quarter 1 Report

The first quarterly report from Year 4, October 2013 to December 2013

TB CARE I Year 4 Quarter 2 Report

The second quarterly report from Year 4, January 2014 to March 2014

TB CARE I Year 4 Quarter 3 Report

The third quarterly report from Year 4, April 2014 to June 2014

UNIVERSAL ACCESS

International Standards for Tuberculosis Care 3rd Edition (English)

The International Standards for Tuberculosis Care (ISTC) describes a widely accepted level of care that all practitioners, public and private, should seek to achieve in managing patients who have or are suspected of having TB. The Standards are intended to facilitate the effective engagement of all care providers in delivering high-quality care. This is the third edition, published in March 2014.

ISTC Mobile Application

For the 3rd edition of the ISTC (see above) a mobile application has been developed that features clinical decision algorithms with step by step guidance for diagnosing and managing TB, along with the full text of the ISTC. The application is designed for TB practitioners, providing them with all the essential information for diagnosing and managing TB.

Viet Nam Childhood TB Materials Vietnamese English

Brochures/Posters on the prevention, early detection and treatment of TB in children. Available in Vietnamese and English.

Compendium of Tools & Strategies – To achieve universal access to TB care for at risk and vulnerable groups

This publication is designed to introduce users to the range of tools and strategies available in TB control. The TB community is encouraged to browse the Compendium and to select approaches that meet the needs of specific types of TB patients.

Zimbabwe Engaging Community Organizations in TB Control

These guidelines and the accompanying training manuals, aim to provide guidance on how to involve and collaborate with communities in TB control activities, contributing to increased early TB case detection, treatment adherence and access to quality patient-centered TB services. (Zipped package of 4 files).

TB CARE I - Childhood TB Activities

After decades of being side-lined, the childhood tuberculosis epidemic is now front of stage. TB CARE I has been active in fighting Childhood TB since the start. This six-page document contains an overview of what TB CARE I is doing to help put a stop to this scourge.

TB CARE I - Patient-Centered Approach

This document contains an overview of what constitutes a patient-centered approach, what TB CARE I is doing to make care more patient-centered, a summary of the TB CARE I patient-centered approach tools, and the results of several country experiences.

Childhood TB: A Toolkit

This is a training toolkit to combat childhood TB. The training focuses on building the capacity of HCWs at the primary and secondary level to address and manage TB in children.

LABORATORY STRENGTHENING

Intensified implementation of GeneXpert MTB/RIF in 3 Countries

The methodology and outcomes of providing intensified support on the implementation of Xpert in three countries: Nigeria, Indonesia and Kazakhstan.

Laboratory Diagnosis of TB by Sputum Microscopy – A Handbook (2nd Edition)

This microscopy handbook uses simple text and clear illustrations to assist laboratory staff in understanding the important issues involved in conducting sputum smear microscopy for the diagnosis of TB.

Microscopy Network Accreditation Tool

The recently published Microscopy Network Accreditation Tool was designed to assess laboratory networks to ensure that conditions, resources and quality assurance are adequate to guarantee overall good results. After decades of being side-lined, the childhood tuberculosis epidemic is now front of stage. TB CARE I has been active in fighting Childhood TB since the start. This six-page document contains an overview of what TB CARE I is doing to help put a stop to this scourge.

Xpert Training Package

The training course is designed for health care workers (including laboratory officers, clinicians and TB program staff) involved in implementation of the Xpert MTB/RIF assay. The purpose is to provide knowledge and skills necessary to; (1) perform the Xpert assay in an accurate and reliable manner, (2) use the Xpert results for proper management of TB patients, and (3) plan and monitor implementation. The training packages consist of training modules with customization guidelines, participant and facilitator guides, materials to perform and facilitate an effective training program, exercises and instruction for lab practical trainings, and reference material to support each module.

TB INFECTION CONTROL

Ndola District TB-IC Demonstration Project Final Report

The Ndola District TB IC demonstration project (2011-2014) was implemented to provide safe work practices reducing TB transmission in particular among PLHIV and HCWs in 15 health facilities, surrounding communities and households of TB patients. The report highlights key experiences, findings and recommendations to enhance TB Infection control in Zambia.

PMDT

PPM PMDT Linkage – A Toolkit

One of the obstacles in scale up of PMDT is the poor linkage of PMDT with hospitals and private practitioners. This toolkit is designed to help establish better links and is a collection of best practices and lessons learnt from the experiences in the participating countries, including inputs for improvement and use of PPM PMDT linkage assessment and planning.

Medical Management of Multidrug-Resistant Tuberculosis - 2nd Edition **English** **Russian**

This pocket guide is designed to provide practitioners useful information for the clinical management of MDR-TB patients. It draws from WHO international guidelines whenever possible. When WHO guidelines do not cover a specific topic, it provides recommendations based on interpretations of cohort studies, clinical trials, case reports and personal experience.

TB/HIV

Counting on Us

This report focuses on the reported mortality among TB patients in five African countries and progress in ensuring the survival of vulnerable TB patients, particularly dual diagnosed TB/HIV patients.

MONITORING AND EVALUATION

Innovations in TB Data Quality - An M&E Workshop Facilitators Guide

In order to ensure that adequate capacity exists to meet the increasingly stringent M&E requirements, this course was designed to build the capacity of M&E Officers of NTPs and technical partners. This course has three over-arching themes. They are to avoid, detect, and fix data quality problems. These three themes seamlessly map onto the three tracks of our TB work, which is to prevent, diagnose, and treat TB.

Understanding and Using TB Data

The handbook shows how to use various data sources, presents existing tools to analyze the quality of data and describes methods to estimate the burden of TB and related trends. It is aimed at NTP managers, M&E officers, researchers including epidemiologists and statisticians, and staff working with technical, financial and development agencies.

COSTING

TB CARE I Costing Tools

The estimation and projection of costs are essential for the planning, budgeting, financing and evaluation of TB services. To meet this need TB CARE I has developed four costing tools which are presented in this four-page document.

Modeling the Cost-Effectiveness of Multi-Drug Resistant

Tuberculosis Diagnostic and Treatment Services in Indonesia
A guide to the creation of a simple, generic and user-friendly model accessible to NTP managers at national and local levels for conducting cost and cost-effective analyses of MDR-TB diagnostic and treatment services. Analyses were conducted in Indonesia, but are applicable a global context.

MDR-TB Cost-Effectiveness Analysis Tool (Zipped Package)

The MDR-TB Cost-Effectiveness Analysis Tool is a simple, user-friendly, generic tool that is available for countries to use to compare the cost-effectiveness of different diagnoses and treatment methods for MDR-TB. The tool builds on previous studies on the cost-effectiveness of MDR-TB, and on WHO guidelines on cost and cost-effectiveness analysis of TB control. It can be used to compare the costs and effectiveness of different treatment strategies from the provider perspective. For outcome measures the tool uses case completion rate, the cure rate and the cost of deaths averted. The intended users are district, provincial and central level TB program managers and planners. This package contains an excel workbook and an instructional file.

TB Economic Burden Analysis Model (Zipped Package)

The TB Economic Burden Analysis Tool is designed to help national and sub-national Program Managers and others calculate the economic burden. Based on treatment numbers and assumptions on drop out rates etc., the tool adds treatment costs, patients costs, and productivity losses to calculate the total economic burden. The tool uses Microsoft Excel and is designed to be used by TB Program Managers at national and sub-national levels. It has a user guide, is user-friendly and transparent and modifications can be made by the user. Although the tool was developed for TB services, it could be adapted for other vertical programs, such as malaria and HIV/AIDS and it can be used in any country.

The Economic Burden of Tuberculosis in Indonesia

Understanding the economic burden to society from a disease like TB is important as it can be used as evidence when advocating for greater investment. This report describes the development of a tool to estimate the economic burden of TB in Indonesia and the results stemming from its use. The development and use of the tool was requested by the NTP in Indonesia to assist with advocacy for greater resources.

TB Services Costing Tool (Zipped Package)

The TB Services Costing Tool allows the user to develop 10 year cost projections based on incidence and treatment targets for TB and MDR-TB and more years can be added if necessary. It has been used in Indonesia to develop national cost estimates for national strategic planning and also to develop cost estimates for Central Java Province. The package contains two excel files - one filled example and one empty version.

Costs faced by Multi-drug Tuberculosis Patients During Diagnosis and Treatment - Report from a pilot study in Ethiopia, Indonesia and Kazakhstan

This report summarizes the main findings on TB/MDR-TB patient costs in the three pilot countries, and recommendations from respective policy workshops.

Costs faced by Multi-drug Resistant Tuberculosis Patients during Diagnosis and Treatment - Report from a Pilot Study in Ethiopia

Ethiopia has a high prevalence of TB and it is also one of the countries where many people who develop TB every year do not get treated. One of the reasons why infected people delay or do not seek diagnosis and treatment is economic access – the cost to patients and their families. This report documents a pilot study, which was undertaken to determine the financial impact of MDR-TB diagnosis and treatment.

Costs faced by Multi-drug Tuberculosis Patients During Diagnosis and Treatment - Report from a Pilot Study in Kokshetau, Akmola Oblast, Kazakhstan

TB patients face costs due to charges for health services, costs for transport, accommodation, nutrition and inability to work. These costs are expected to be higher for MDR-TB patients than for other TB patients. In most countries, MDR-TB is more prevalent in socially more vulnerable groups, for which the economic impact of the disease may be even bigger. This report analyses the costs faced by MDR-TB patients in Kazakhstan

Costs Faced By Multi-drug Tuberculosis Patients During Diagnosis and Treatment - Report from a Pilot Study in Indonesia

In most countries, MDR-TB is more prevalent in vulnerable groups, for which the economic impact of the disease may be even bigger. Policy makers such as Ministries of Health and NTPs need to understand patient costs to identify and mitigate potential bottlenecks in access to and adherence to TB/MDR-TB treatment and the negative impact on the economic status of patients and their families. This report analyses the costs faced by MDR-TB patients in Indonesia.

Coverage of TB Services under Social Health Insurance in Indonesia

An analysis of national claims data obtained from the public health insurance schemes and carried out via interviews with health and insurance managers and non-governmental organizations in three Indonesian provinces – Aceh, Jakarta and West Java.

The Cost of Scaling Up TB Services in Central Java, Indonesia

To assist the Indonesian NTP to analyze and project service delivery costs, a simple, user-friendly costing tool was developed for use by national, district and provincial program managers (see TB Services Costing Tool above). The tool was developed because there was no existing tool suitable for sub-national levels, and it was tested in Central Java, a large province with 32 million people.

The Cost of Scaling Up TB Services in Indonesia

To facilitate the development and implementation of the exit strategy for TB, it is necessary to have a good understanding of the cost of current and future services at all levels so that the necessary domestic funding can be provided and areas can be identified where greater efficiency and cost-effectiveness might be achieved. To assist the NTP to analyze and project service delivery costs, a simple, user-friendly costing tool was developed for use by national, district and provincial program managers. The tool was developed because there was no existing tool suitable for sub-national levels, and it was tested in Central Java and the resulting model was then used to estimate the projected costs for the whole country.

UNION CONFERENCE ABSTRACTS AND PRESENTATIONS

In 2013, 50 poster abstracts, 8 oral abstracts, 9 symposia and 1 post-graduate course were supported at the 2013 Union World Conference on Lung Health in Paris.

In 2014, more than 26 poster abstracts, 8 oral abstracts, 6 symposia and 1 post-graduate course were supported at the 2014 Union World Conference on Lung Health in Barcelona.

Full details are available on the website:

<http://www.tbcare1.org/publications/union/>



PHOTOS

- 2 _____ Klaten District Health Facility TB control supervisor - Indonesia (KNCV)
- 3 _____ Practical exercise on archiving GeneXpert data - Kazakhstan (KNCV)
- 4 _____ GeneXpert training - Botswana (Obert Kachuwaire KNCV)
- 8 _____ Using a UVC meter in a TB dispensary - Kazakhstan (KNCV)
- 9 _____ MDR-TB education exercise on treatment support - Nigeria (FHI 360)
- 10 _____ MDR-TB TB patient - Viet Nam (Matthieu Zellweger WHO)
- 11 _____ Child with MDR-TB - Zimbabwe (Jeroen van Gorkom KNCV)
- 12 _____ X-Ray training - Cambodia (Seak Kunrath JATA)
- 18 _____ Mobile X-Ray unit - Cambodia (Rajendra Yadav WHO)
- 19 _____ Sputum sample testing with GeneXpert - Zambia (Roberston Chibumbya MSH)
- 20 _____ TB-IC assessment in TB lab - Uzbekistan (WHO)
- 21 _____ Patient interview on quality of care Indonesia (KNCV)
- 22 _____ Patients centered approach data collection exercise - Zambia (Steven Bwalya MSH)
- 23 _____ Childhood TB poster - Viet Nam (KNCV)
- 24 _____ Community health worker TB patient DOT - Afghanistan (Mostafa Shefa MSH)
- 25 _____ Inmates waiting to be examined by a mobile X-Ray program - Indonesia (KNCV)
- 26 _____ MDR-TB patient supported by his community DOTS provider - Nigeria (FHI 360)
- 28 _____ Former TB patient Aizada Abdykadyrova - Kyrgyzstan (KNCV)
- 29 _____ Busy culture laboratory Hanoi - Viet Nam (Matthieu Zellweger WHO)
- 34 _____ Newly renovated laboratory - Indonesia (KNCV)
- 36 _____ TB microscopy Ugandan SNRL - Uganda (Tristan Bayly KNCV)
- 39 _____ GeneXpert training, Nigeria (KNCV)
- 40 Sputum transportation motorcycle rider delivering specimens - Zimbabwe (N. Miilo The Union)
- 41 _____ TB patient - Zimbabwe (Jeroen van Gorkom KNCV)
- 43 _____ Open air waiting area - Ndola, Zambia (KNCV)
- 44 _____ MDR-TB out-patient clinic - Indonesia (Maarten van Cleeff KNCV)
- 45 _____ TB CARE I Indonesia Director Jan Voskens/woman cured of MDR-TB - Indonesia (KNCV)
- 47 _____ Trainees with their certificates of completion, Center of Excellence - Rwanda (KNCV)
- 48 _____ Patient OI/ART care booklets - Zimbabwe (Jeroen van Gorkom KNCV)
- 51 _____ ART registers- Zimbabwe (Jeroen van Gorkom KNCV)
- 52 _____ GeneXpert - Zimbabwe (The Union)
- 53 _____ Zimbabwe installation and on-site training on Use of GeneXpert (Hebert Mutunzi The Union)
- 54 _____ Cured TB patient travelling to hospital for follow up care - Indonesia (KNCV)
- 55 _____ Exercise during a community health worker training - Zimbabwe (Netty Kamp KNCV)
- 56 _____ Exercise during a community health worker training - Zimbabwe (Netty Kamp KNCV)
- 58 _____ MDR-TB DOTS patients being interviewed - Indonesia (David Collins MSH)
- 59 _____ Data driven supportive supervision at clinic post - Zimbabwe (KNCV)
- 61 _____ Data compilation exercise for M&E specialists - Uzbekistan (KNCV)
- 60 _____ Community members listening to a TB awareness campaign - Nigeria (FHI 360)
- 62 _____ TB CARE I Director Maarten Van Cleeff visiting a laboratory in Indonesia (KNCV)
- 65 _____ MDR-TB Patient receiving his treatment - Kyrgyzstan (Nurgulya Kulbekova, KNCV)
- 66 _____ Trainees conducting a health facility risk assessment - Ethiopia (Max Meis KNCV)
- 67 _____ Ladies waiting at a TB clinic - Zimbabwe (Jeroen van Gorkom KNCV)
- 68 _____ DOT for MDR-TB - Viet Nam (Matthieu Zellweger WHO)
- 69 _____ TB patient with anti-TB drugs - Viet Nam (Matthieu Zellweger WHO)
- 77 _____ A successfully treated DR-TB patient and her children - Tajikistan (Z. Abdulloeva KNCV)

TB CARE I

We would like to acknowledge all the people across the world who make TB CARE I possible; our gratitude and thanks go out to all our partners in the field.

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TB CARE I ANNUAL REPORT YEAR 4

Supporting Data

Ousmane Sembène

Black Docker

"I am ill already, I cough blood. What this you're telling me? Shouted Boubacar Can't you see her face? broke in his wife. I didn't notice it earlier. You'll come with me and see a doctor."

John Keats

Bright Star

"On the night I was taken ill –when so violent a rush of blood came to my Lungs that I felt nearly suffocated –I assure you I felt it possible I might not survive, and at that moment thought of nothing but you."

Fyodor Dostoyevsky

Crime and Punishment

"A rather tall, slim and graceful woman, terribly emaciated, with magnificent dark brown hair and with a hectic flush in her cheeks. ...her lips were parched and her breathing came in nervous broken gasps. Her eyes glittered as in fever and looked about with a harsh, immovable stare. And that consumptive and excited face with the last flickering light of the candle-end playing upon it made a sickening impression".

Charles Dickens

Nicholas Nickleby

"There is a dread disease which so prepares its victim, as it were, for death; which so refines it of its grosser aspect, and throws around familiar looks unearthly indications of the coming change; a dread disease, in which the struggle between soul and body is so gradual, quiet, and solemn, and the result so sure, that day by day, and grain by grain, the mortal part wastes and withers away"

John Bunyan

The Life and Death of Mr. Badman

"Yet the captain of all these men of death that came against him to take him away was the consumption, for it was that that brought him down to the grave"

Sylvia Plath

The Bell Jar

"TB is like living with a bomb in your lungs. You just lie around very quietly hoping it won't go off"

Number of cases notified (all forms and new pulmonary bacteriologically confirmed) and percent male of new & relapse cases, 2010-2013 (WHO 2014)*

TB CARE I Country	2010			2011			2012			2013*		
	All forms	New confirmed	% male (new confirmed)	All forms	New confirmed	% male (new confirmed)	All forms	New confirmed	% male (new confirmed)	All forms	New pulmonary bacteriologically confirmed	% male (new & relapse)
Afghanistan	28,238	12,947	33%	28,167	13,789	34%	29,578	13,319	33%	31,622	14,277	40%
Botswana	7,632	3,295	56%	6,733	2,669	56%	6,223	2,426	54%	6,958	2,414	57%
Cambodia	41,628	17,454	54%	39,670	15,812	54%	39,156	14,838	56%	39,055	14,082	55%
Ethiopia	156,928	46,634	56%	159,017	49,594	56%	147,592	47,236	U	131,677	43,860	50%
Ghana	15,145	7,656	67%	15,840	7,616	65%	15,207	7,097	68%	15,606	7,301	65%
Indonesia	302,861	183,366	60%	321,308	197,797	59%	331,424	202,319	59%	327,103	196,310	58%
Kazakhstan	24,854	4,769	61%	20,365	4,157	64%	21,523	3,884	62%	19,857	7,942	62%
Kenya	106,083	36,260	61%	103,981	37,085	62%	99,149	36,937	62%	89,796	34,686	59%
Kyrgyzstan	6,295	1,645	59%	6,215	1,537	59%	6,916	1,594	61%	7,209	1,667	57%
Mozambique	46,174	20,097	0%	47,452	19,537	0%	50,827	20,951	U	56,220	23,115	
Namibia	12,625	4,464	56%	11,938	4,503	56%	11,145	4,333	58%	10,610	4,331	59%
Nigeria	90,447	45,416	61%	93,050	47,436	61%	97,853	52,901	61%	100,401	52,811	59%
South Sudan				7,583	2,797	62%	8,924	3,120	67%	6,959	3,028	67%
Tajikistan	6,944	2,290	56%	6,864	2,174	54%	6,232	2,041	55%	6,495	2,205	56%
Uganda	45,546	23,456	64%	49,018	25,614	64%	47,211	24,916	65%	47,650	25,442	65%
Uzbekistan	20,330	4,711	57%	15,069	4,198	56%	16,765	4,030	57%	25,168	5,505	61%
Viet Nam	96,441	52,145	74%	100,518	50,751	75%	103,906	51,033	75%	102,196	50,607	74%
Zambia	48,616	12,639	0%	48,594	12,046	62%	45,277	12,645	63%	45,793	12,238	59%
Zimbabwe	47,557	11,654	52%	41,305	12,596	55%	38,720	12,163	56%	35,278	11,404	56%
Grand Total	1,104,344	490,898	56% (total #: 277,946)	1,122,687	511,708	58% (total #: 299,473)	1,123,628	517,783	53% (total #: 277,209)	1,105,653	513,225	59%**

*New case definitions as of 2013

** 526,542 males/899,697 cases with gender known

Number of sputum smear positive (SS+) cases successfully treated and treatment success rate (TSR), 2009-2011, and number of new & relapse cases successfully treated and TSR, 2012 (WHO 2014)

TB CARE I Country	2009		2010		2011		2012	
	# SS+ Successfully Treated	TSR (SS+) %	# SS+ Successfully Treated	TSR (SS+) %	# SS+ Successfully Treated	TSR (SS+) %	New & relapse cases successfully treated	TSR (SS+) %
Afghanistan	10,806	86	11,621	90	12,601	91	25,128	88
Botswana	2,772	79	2,698	81	2,532	81	5,781	76
Cambodia	16,974	95	16,389	94	14,851	93	36,057	94
Ethiopia	37,680	84	38,484	83	37,158	90	41,480	91
Ghana	7,178	87	6,549	86	6,568	86	12,439	84
Indonesia	154,294	91	165,564	90	178,322	90	281,171	86
Kazakhstan	3,341	62	2,995	61	2,641	61	14,068	86
Kenya	32,112	86	31,606	87	32,382	88	84,195	86
Kyrgyzstan	1,272	82	0		1,201	78		
Mozambique	16,647	85	17,075	85	0		18,179	87
Namibia	4,010	85	3,859	85	3,799	84	7,518	85
Nigeria	37,048	83	37,978	84	40,555	85	77,613	86
South Sudan			1,588	75	2,017	73	4,413	52
Tajikistan	1,604	81	1,834	80	1,732	80	4,845	83
Uganda	15,556	67	16,673	71	19,846	77	20,304	77
Uzbekistan	4,037	81	3,819	81	3,291	78	11,905	84
Viet Nam	47,500	92	48,149	92	47,063	93	94,468	91
Zambia	11,760	90	11,307	86	11,134	88	34,938	85
Zimbabwe	7,999	78	9,493	81	10,203	81	30,764	81
Grand Total	415,679		430,374		431,032		805,266	

Number (and rate per 100,000 for 2013) of confirmed TB cases among HCWs, 2010-2013 (WHO 2014)

TB CARE I Country	2010	2011	2012	2013	
Botswana			37	74	
Ghana	0	11	21		
Kazakhstan	139		35	30	185
Kyrgyzstan		42	23	45	65
Mozambique	19		117	193	506
Namibia	3			44	
Tajikistan		24	22	9	232
Uzbekistan	138	180	131	89	20
Grand Total	299	257	386	484	

Number of confirmed MDR-TB patients diagnosed and started on treatment, 2010- 2013, number of RR/MDR-TB diagnosed, 2013, and number of confirmed and unconfirmed MDR-TB started on treatment, 2013 (WHO 2014)

TB CARE I countries	2010		2011		2012		2013			
	Confirmed MDR diagnosed	Confirmed MDR-TB started on treatment	Confirmed MDR diagnosed	Confirmed MDR-TB started on treatment	Confirmed MDR diagnosed	Confirmed MDR-TB started on treatment	Confirmed MDR diagnosed	RR-/MDR-TB diagnosed	Confirmed MDR-TB started on treatment	Confirmed & unconfirmed MDR-TB started on treatment
Afghanistan	19	0	19	19	31	31	49	73	48	49
Botswana	106	92	46	45	53	43	62	67	62	99
Cambodia	31	31	56	56	75	20	9	121	112	121
Ethiopia	140	111	212	182	284	270	522	558	386	413
Ghana	4	3	7	2	20	2	38	65	26	26
Indonesia	182	142	383	260	428	426	502	912	587	809
Kazakhstan	7,387	4,808	7,408	4,684	7,608	6,525	6,032	6,411	6,112	6,776
Kenya	112	118	166	156	225	194	102	160	290	290
Kyrgyzstan	566	566	806	492	958	667	1,160	1,191	1,064	1,064
Mozambique	165	87	283	146	266		359	444	313	313
Namibia	214	214	192	192	210	210	180	283	165	170
Nigeria	21	23	95	38	107	107	115	554	115	426
South Sudan			6		3		1	1	0	0
Tajikistan	333	245	604	376	694	489	911	2,084	625	625
Uganda	93	10	71	7	89	41	82	117	110	199
Uzbekistan	1,023	628	1,385	855	1,728	1,489	3,030	5,751	2,647	2,647
Viet Nam	101	101	601	578	273	253	207	1,204	207	948
Zambia					80	80	79	79	79	79
Zimbabwe	17	27	118	64	149	105	93	433	93	351
Grand Total	10,514	7,206	12,458	8,152	13,281	10,952	13,533	20,508	13,041	15,405

Number (percent) of MDR-TB patients registered on treatment, the number that successfully completed treatment for MDR-TB and percent treatment success, 2009-2011 (WHO 2014)

TB CARE I countries	2009			2010			2011		
	# MDR-TB treated successfully	# Confirmed started on treatment	% Treatment success	# MDR-TB treated successfully	# Confirmed started on treatment	% Treatment success	#MDR-TB treated successfully	# Confirmed started on treatment	% Treatment success
Afghanistan							6	21	29%
Botswana	77	106	73%	92	146	63%	31	44	70%
Cambodia	36	46	78%	21	31	68%	48	56	86%
Ethiopia	66	73	90%	96	114	84%	84	116	72%
Ghana	0	0		1	3	33%	1	2	50%
Indonesia	14	19	74%	101	140	72%	156	260	60%
Kazakhstan	2,851	3,897	73%	4,197	5,777	73%	3,910	5,261	74%
Kenya	61	89	69%	79	96	82%	86	122	70%
Kyrgyzstan	193	545	35%	236	556	42%	280	492	57%
Mozambique	0	137	0%	8	28	29%	49	157	31%
Namibia	115	275	42%	125	216	58%	115	194	59%
Nigeria				14	23	61%	24	38	63%
South Sudan									
Tajikistan	37	52	71%	151	245	62%	242	380	64%
Uganda	1	1	100%	9	10	90%	10	13	77%
Uzbekistan	285	464	61%	366	628	58%	455	855	53%
Viet Nam	74	101	73%	76	97	78%	417	579	72%
Zambia				20	56	36%	23	79	29%
Zimbabwe	1	1	100	4	6	67%	57	70	81%
Grand Total	3,811	5,805	66%	5,596	8,172	68%	5,994	8,739	69%

Number individuals trained (including gender breakdown) with TB CARE I funds in Year 4 compared to number of planned trainees, stratified by technical area (country projects only)*

Technical area	Year 4				
	# Trained males	# Trained females	Total # Trained	Total # planned for training	% Completion
Universal Access	3,088	1,763	4,851	5,337	91%
Laboratories	1,257	1,241	2,498	2,421	103%
TB IC	1,075	841	1,916	1,183	162%
PMDT	728	768	1,496	1,412	106%
TB/HIV	498	557	1,055	732	144%
HSS	479	500	979	907	108%
M&E	768	388	1,156	1,194	97%
Drug Supply & Management	200	245	445	435	102%
Other	522	516	1,038	837	124%
Core-funded	118	114	232		
Region-funded	53	53	106		
Grand Total	8,786	6,986	15,772	14,458	107%

*Number of people trained with core and regional funds are also presented.

